Vol. 1035 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 4, 1983 Volume 1035 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Aug. 1983

Affirmed	197
Affirmed in Part	25
Reversed	63
Total	285

Location of Board of Appeals, Board of Patent Interferences and the Office of the Solicitor

This is to advise you that the Patent and Trademark Office recently relocated the Board of Appeals, Board of Patent Interferences, and the Office of the Solicitor. Listed below are the new locations and the mailing addresses to be used for these areas:

Board of Appeals
Location: Crystal Gateway 2, Room 10A01
1225 Jefferson Davis Hwy.
Arlington, Va. 22202
Mailing Address: Clerk of the Board
CG2-10C09
Washington, D.C. 20231

Board of Patent Interferences
Location: Crystal Gateway 2, Rm. 10C01
1225 Jefferson Davis Hwy.
Arlington, Va. 22202
Mailing Address: CG2-10C01
Washington, D.C. 20231

Office of the Solicitor
Location: Crystal Gateway 2, Rm. 12C01
1225 Jefferson Davis Hwy.
Arlington, Va. 22202
Mailing Address: CG2-12C01
Washington, D.C. 20231

Use of the Arlington, Va. address for mailing purposes may result in an unpredictable delay. Use the specified mailing address only.

THERESA A. BRELSFORD,
Aug. 30, 1983. *Assistant Commissioner for Administration.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,277,937, Re. S.N. 513,463, Filed July 13, 1983, Cl. 56/17.5, CONVERTIBLE ROTARY MOWER-VACUUM SWEEPER, Woodrow W. Luick, Corpus Christi, Tex., Owner of Record: *Inventor,* Attorney or Agent: G. Turner Moller, Ex. Gp.: 333

4,279,605, Re. S.N. 513,669, Filed July 14, 1983, Cl. 474/82, FRONT DERAILLEUR FOR A BICYCLE, Tetsufumi Egami, Owner of Record: *Shimano Industrial Co. Ltd., Osaka, Japan,* Attorney or Agent: Ellsworth H. Mosher, Ex. Gp.: 352

4,306,871, Re. S.N. 513,326, Filed July 13, 1983, Cl. 444/82, REAR DERAILLEUR AND CONTROL WIRE GUIDE, Masashi Nagano, Owner of Record: *Shimano Industrial Co. Ltd., Osaka, Japan,* Attorney or Agent: Ellsworth H. Mosher, Ex. Gp.: 352

4,317,327, Re. S.N. 513,321, Filed July 15, 1983, Cl. 56/396, PUSHED DETHATCHING UNIT, Charles W. Doering, Owner of Record: *Brinly-Hardy Co., Inc., Louisville, Ky.,* Attorney or Agent: Frank C. Leach, Jr., Ex. Gp.: 333

4,355,100, Re. S.N. 513,799, Filed July 14, 1983, Cl. 430/544, SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL, Hiroshi Sugita, et al., Owner of Record: *Konishiroku Photo Industry Co., Ltd., Tokyo, Japan,* Attorney or Agent: Douglas B. Henderson, Ex. Gp.: 166

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,362,627, Reexam. No. 90/000,434, Requested: Aug. 17, 1983, Cl. 417/354, VENTILATOR, Hermann Papst, Owner of Record: *Papst-Motoren KG, St. Georgen, Black Forest, Germany,* Attorney or Agent: Michael S. Striker, Ex. Gp.: 343, Requester: Papst-Motoren GmbH & Co. KG, c/o Fitch, Even, et al., Chicago, Ill.

3,579,540, Reexam. No. 90/000,439, Requested: Aug. 30, 1983, Cl. 260/33.4, METHOD FOR PROTECTING NON-POROUS SUBSTRATES AND FOR RENDERING THEM WATER REPELLANT, Howard G. Ohlhausen, Owner of Record: *Inventor,* Attorney or Agent: Seymour Rothstein, Ex. Gp.: 140, Requester: Howard G. Ohlhausen, Scottsdale, Ariz.

4,127,416, Reexam. No. 90/000,440, Requested: Aug. 31, 1983, Cl. 106/73.2, METHOD OF PRODUCING A CERAMIC PRODUCT, Roland John Lumby, et al., Owner of Record: *Requester,* Attorney or Agent: Holman & Stern, Chartered, Ex. Gp.: 113, Requester: Lucas Industries, Ltd., Birmingham, England

4,337,805, Reexam. No. 90/000,436, Requested: Aug. 22, 1983, Cl. 141/71, AGRICULTURAL BAG LOADING APPARATUS, William C. Johnson, et al., Owner of Record: *AG-Bag Corp., Arlington, Nebr.,* Attorney or Agent: Michael A. O'Neil, Ex. Gp.: 243, Requester: American Bag All Corp., Fawn Grove, Pa.

4,382,820, Reexam. No. 90/000,442, Requested: Sept. 6, 1983, Cl. 106/90, STRUCTURAL COMPOSITION FOR MACHINE TOOL BODIES AND MEMBERS, Kiyoshi Inoue, Owner of Record: *Inoue-Japan Research, Inc., Yokohamashi, Japan,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 113, Requester: Thad F. Kryshak, Milwaukee, Wis.

4,396,251, Reexam. No. 90/000,441, Requested: Aug. 31, 1983, Cl. 350/349, PLEOCHROIC COLOR DISPLAY DEVICE, Akio Mukoh, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan,* Attorney or Agent: William I. Solomon, Ex. Gp.: 250, Requester: Owner

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Information in Oath/Declaration Necessary to Identify the Specification in Accordance with 37 CFR 1.63

Section 1.63 of 37 CFR requires that an oath or declaration "identify the specification to which it is directed." Since filing dates are now granted on applications with the oath or declaration being filed later with a surcharge, the question has arisen as to what information must be supplied in the oath or declaration to identify the specification to which it is directed and to comply with the rule.

The declaration form suggested by the Office includes spaces for filling in the names of the inventors, title of invention, application serial number, filing date, foreign priority application information and United States priority application information. While this information should be provided, it is not essential that all of these spaces be filled in in order to adequately identify the specification in compliance with 37 CFR 1.63.

The following combinations of information supplied in an oath or declaration are acceptable as minimums for identifying a specification:

(1) name of inventor and application serial number;
(2) name of inventor, attorney docket number which was on the application as filed, and filing date of the application;
(3) name of inventor, title of invention and filing date;
(4) name of inventor, title of invention and reference to a specification which is attached to the oath or declaration at the time of execution and filed with the oath or declaration;
(5) name of inventor, title of invention and a statement by a registered attorney or agent that the application filed in the PTO is the application which the inventor executed by signing the oath or declaration.

If the oath or declaration is filed with an "attached" specification as indicated in item (4) above, it must be accompanied by a statement that the "attached" specification is a copy of the specification and any amendments thereto which were filed in the Office in order to obtain a filing date for the application. Such statement must be a verified statement if made by a person not registered to practice before the Office.

Oaths or declarations which do not meet the requirements set forth above will not be accepted as complying with 37 CFR 1.63 for completing an application. Any variance from the above guidelines will only be considered upon the filing of a petition for waiver of the rules under 37 CFR 1.183 accompanied by a petition fee (37 CFR 1.17(h)). Supplemental oaths or declarations in accordance with 37 CFR 1.67 will be required in applications in which the oaths or declarations are not completely filled in but contain sufficient information to identify the specifications to which they apply as detailed above.

Sept. 12, 1983.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY

SN 4-578,938 (4,354,192). RADIO RANGING.
SN 4-624,666 (4,360,812). FM-CW FUZE.
SN 5-953,292 (4,369,811). NULL BALANCING FOR FLUIDIC SENSORS AND AMPLIFIERS.
SN 6-074,634 (4,357,713). METHOD AND APPARATUS FOR REDUCTION OF MODAL NOISE IN FIBER OPTIC SYSTEMS.
SN 6-111,738 (4,373,553). BROAD BAND FLUERIC AMPLIFIER.
SN 6-133,735 (4,335,655). METHOD AND APPARATUS FOR DETONATING EXPLOSIVE IN RESPONSE TO DETONATION OF REMOTE EXPLOSIVE.
SN 6-142,548 (4,362,106). FLOW DEFLECTOR FOR AIR DRIVEN POWER SUPPLY.
SN 6-153,461 (4,350,315). DEVICE TO DE-SPIN OBJECTS WITH VERY HIGH SPIN.
SN 6-158,556 (4,345,460). MULTI-CALIBER PROJECTILE SOFT RECOVERY SYSTEM.
SN 6-169,004 (4,341,158). APPARATUS FOR ELIMINATING POWER SOURCE RISE TIME EFFECTS IN A TIME FUZE SYSTEM.
SN 6-175,543 (4,367,474). FREQUENCY-AGILE, POLARIZATION DIVERSE MICROSTRIP ANTENNAS AND FREQUENCY SCANNED ARRAYS.
SN 6-176,319 (4,348,649). MICROWAVE POWER PULSE GENERATOR.
SN 6-198,673, (4,379,296). SELECTABLE-MODE MICROSTRIP ANTENNA AND SELECTABLE-MODE MICROSTRIP ANTENNA ARRAYS.
SN 6-216,232 (4,375,082). HIGH SPEED RECTANGLE FUNCTION GENERATOR.

SN 6-217,881 (4,381,002). FLUIDIC-CONTROLLED OXYGEN INTERMITTENT DEMAND FLOW DEVICE.
SN 6-230,177 (4,360,896). WRITE MODE CIRCUITRY FOR PHOTOVOLTAIC FERROELECTRIC MEMORY CELL.
SN 6-278,263 (4,382,678). MEASURING OF FEATURE FOR PHOTO INTERPRETATION.
SN 6-290,138 (4,392,348). DEVICE FOR BLEEDING MOTOR GASES THRU MOTOR POLE PIECE.
SN 6-311,368 (4,385,055). 2-ACETYL-AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES AS ANTIMALARIALS.
SN 6-316,574 (4,393,048). PROTECTIVE GEL COMPOSITION FOR WOUNDS.
SN 6-316,575 (4,391,799). PROTECTIVE GEL COMPOSITION FOR TREATING WHITE PHOSPHORUS BURN WOUNDS.
SN 6-348,538 (4,391,993). THERMOLYSIS OF TETRAALKYLAMMONIUM BOROHYDRIDES TO BIS (TETRAALKYLAMMONIUM) DECAHYDRODECARBORANES.
SN 6-385,999. WIDE RANGE DOPPLER DEMODULATOR IN FM RADAR.
SN 6-393,223. METHOD FOR DETECTING THE PRESENCE OF A GAS IN AN ATMOSPHERE.
SN 6-411,074. POWER SUPPLY CONDITIONER FOR FLUIDIC SYSTEMS.
SN 6-437,607. PHASE SCANNED MICROSTRIP ARRAY ANTENNA.
SN 6-504,117. SPIN SAMPLE READER.
SN 6-514,113. SOLID FUEL RAMJET TUBULAR PROJECTILE FOR DIRECT FIRE CANNON.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-500,833. REPAIR OF TISSUE IN ANIMALS.

Department of Treasury
United States Customs Service

(T.D. 83-179)

Recordation of Trade Name: "Players & Spectators A Drinking and Gaming Establishment"

Agency: U.S. Customs Service, Treasury

Action: Notice of Recordation

Summary: On May 17, 1983, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "PLAYERS & SPECTATORS A DRINKING AND GAMING ESTABLISHMENT," was published in the Federal Register (48 FR 22252). The notice advised that before final action on the application, consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than July 18, 1983. No responses were received in opposition to the application.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the trade name "PLAYERS & SPECTATORS A DRINKING AND GAMING ESTABLISHMENT" is recorded as the trade name used by Players & Spectators, Inc., a corporation organized under the laws of the State of Washington, located at East 27 Augusta, Spokane, Wash. 99207. The trade name is used in connection with a combined restaurant, tavern and amusement game services and franchise business.

Date: Sept. 2, 1983

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., N.W., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Aug. 25, 1983. *Director, Entry Procedures and Penalties Division.*

Erratum

The following registration number, listed in the "Trademarks Registrations Issued" section of the Official Gazette of Feb. 23, 1982 was inadvertently issued:

1,190,770 TMOG Feb. 23, 1982

Consequently, the certificate of registration bearing the above-identified number was not issued on the date indicated, and this registration number has been vacated.

MARK K. NEUMAN,
Sept. 7, 1983. *Director, Trademark Examining Operation.*

Erratum

The following registration number, listed in the "Trademarks Registrations Issued" section of the Official Gazette of Aug. 23, 1983 was inadvertently issued:

1,248,844 TMOG Aug. 23, 1983

Consequently, the certificate of registration bearing the above-identified number was not issued on the date indicated, and this registration number has been vacated.

MARK K. NEUMAN,
Sept. 7, 1983. *Director, Trademark Examining Operation.*

PATENT NOTICES

Certificates of Correction for the Week of Oct. 4, 1983

Re. 31,243	4,354,009	4,387,775	4,393,752
Re. 31,290	4,360,657	4,387,950	4,393,804
3,913,294	4,361,375	4,388,339	4,394,235
3,972,934	4,361,546	4,388,505	4,394,242
4,167,612	4,361,746	4,389,060	4,394,294
4,192,640	4,363,999	4,389,460	4,394,428
4,201,584	4,366,062	4,389,530	4,394,513
4,256,961	4,366,718	4,389,676	4,395,165
4,289,570	4,368,187	4,389,713	4,395,244
4,293,436	4,368,879	4,390,501	4,395,251
4,295,222	4,370,329	4,390,543	4,395,277
4,296,234	4,372,754	4,390,698	4,395,572
4,297,220	4,373,348	4,390,819	4,395,702
4,301,078	4,373,487	4,390,833	4,395,772
4,308,754	4,375,264	4,390,957	4,395,890
4,322,640	4,376,759	4,391,011	4,396,043
4,328,358	4,381,541	4,391,117	4,397,077
4,330,507	4,382,028	4,391,213	4,397,602
4,343,918	4,383,076	4,392,496	4,397,774
4,345,944	4,386,199	4,392,940	4,397,904
4,353,813	4,387,732	4,393,696	4,398,017

Disclaimers

3,523,794.—*Vincent J. Miceli,* Conklin, N.Y. DEVELOPERS CONTAINING SILVER HALIDE SOLVENTS. Patent dated Aug. 11, 1970. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,869,205.—*Charles F. Gallo,* Penfield, N.Y. ILLUMINATION SOURCE FOR XEROGRAPHIC EXPOSURE. Patent dated Mar. 4, 1975. Disclaimer filed Mar. 3, 1983, by the assignee, *Xerox Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,324,839.—*Robert B. Frye,* Menands, N.Y. SILICONE RESIN COATING COMPOSITION. Patent dated Apr. 13, 1982. Disclaimer filed Aug. 24, 1983, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1 through 11 of said patent.

Disclaimers and Dedications

3,332,755.—*Ira Kukin,* West Orange, N.J. FUEL ADDITIVE. Patent dated July 25, 1967. Disclaimer and Dedication filed Mar. 10, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby enters this disclaimer to all claims and dedicates to the Public the entire term of said patent.

4,035,530.—*Stephen H. Stoldt,* Dover, N.J. METHOD OF INHIBITING SULFIDATION AND MODIFYING DEPOSITS. Patent dated July 12, 1977. Disclaimer and Dedication filed Mar. 10, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby enters this disclaimer to all claims and dedicates to the Public the entire term of said patent.

4,042,348.—*Robert P. Bennett,* Bridgewater; *Matthew J. O'Connor,* Flanders; *Alfred E. Kober,* Hopatcong, and *Ira Kukin,* West Orange, N.J. METHOD OF CONDITIONING FLUE GAS TO ELECTROSTATIC PRECIPITATOR. Patent dated Aug. 16, 1977. Disclaimer and Dedication filed Mar. 10, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby enters this disclaimer to all claims and dedicates to the Public the entire term of said patent.

4,043,768.—*Robert P. Bennett,* Bridgewater, and *Matthew J. O'Connor,* Flanders, N.J. METHOD OF CONDITIONING FLUE GAS TO ELECTROSTATIC PRECIPITATOR. Patent dated Aug. 23, 1977. Disclaimer and Dedication filed Mar. 10, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby enters this disclaimer to all claims and dedicates to the Public the entire term of said patent.

4,057,398.—*Robert P. Bennett,* Bridgewater, and *Ira Kukin,* West Orange, N.J. PROCESS FOR REDUCING THE FUSION POINT OF COAL ASH. Patent dated Nov. 8, 1977. Disclaimer and Dedication filed Mar. 10, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby enters this disclaimer to all claims and dedicates to the Public the entire term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

OCTOBER 4, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,449,280 (126th)

ADHESIVE COMPOSITION CONTAINING HIGH MOLECULAR WEIGHT POLYAMIDES, EPOXY RESINS AND CURING AGENTS

Robert A. Frigstad, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Reexamination Request No. 90/000,236, Aug. 2, 1982.

Reexamination Certificate for Patent No. 3,449,280, issued Jun. 10, 1969, Ser. No. 24,882, Apr. 27, 1960.

Int. Cl.[3] **C08K** *3/20*

U.S. Cl. 523—402

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

1. A composition of matter which provides, when cured as a coating on smooth metal surfaces, unusually good resistance to peel forces and high resistance to chemical attack, said composition comprising by weight 13–98 parts of methanol-soluble nylon polyamide, 2–87 parts of epoxy resin, and a curing agent for epoxy resin in amount sufficient to harden the epoxy resin to a thermoset state, said polyamide being a long chain synthetic polymer which has recurring carbonamide groups as an integral part of the main polymer chain and is capable of forming strong cold drawn fibers.

B1 4,229,211 (125th)

LADLE HEATING SYSTEM

Donald D. Battles, Atlanta, Ga., assignor to The Cadre Corporation, Doraville, Ga.

Reexamination Request No. 90/000,274, Oct. 19, 1982.

Reexamination Certificate for Patent No. 4,229,211, issued Oct. 21, 1980, Ser. No. 92,374, Nov. 8, 1979.

Continuation-in-part of Ser. No. 22,687, Mar. 21, 1979, Pat. No. 4,229,211.

The portion of the term of this patent subsequent to Sep. 22, 1997, has been disclaimed.

Int. Cl.[3] **F27B** *14/14*

U.S. Cl. 266—44

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

Claim **21** is determined to be patentable as amended:

Claim **22** dependent on an amended claim, is determined to be patentable.

21. In a combination with apparatus for heating ladles or the like, a seal assembly for movement into sealing abutment with the rim of *a* [the] ladle, said seal assembly comprising a support frame and a layer of compressible refractory fiber material supported by said support frame and arranged in a configuration to engage the rim of the ladle and form a seal about the rim of the ladle, *duct means extending through said compressible refractory fiber material for exhausting gases from the ladle, and a burner mounted to said seal assembly for directing a flame into the ladle, whereby the fiber material of the seal assembly can form a seal about the rims of ladles of different sizes and shapes and compensate for the build up of slag on the rims of the ladles and for chips or cracks in the rims of the ladles.*

B1 4,270,596 (124th)

TUBE MAT HEAT EXCHANGER

Michael F. Zinn; Steven E. Krulick, and Ronald W. Leonard, all of Spring Glen, N.Y., assignors to Bio-Energy System, Inc., Ellenville, N.Y.

Reexamination Request No. 90/000,291, Nov. 22, 1982.

Reexamination Certificate for Patent No. 4,270,596, issued Jun. 2, 1981, Ser. No. 17,728, Mar. 5, 1979.

Int. Cl.[3] **F28F** *1/22, 1/16, 9/04*

U.S. Cl. 165—1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–28** having been finally determined to be unpatentable, are cancelled.

New claims **29–56** are added and determined to be patentable.

29. A heat exchanger element comprising

(a) a plurality of flexible elongated rollout mats integrally extruded of elastomeric material;

(b) each of said mats comprising

i. a plurality of flexible parallel fluid-conducting tubes,

ii. a plurality of flexible webs in each mat connecting and spacing adjacent pairs of tubes, and

iii. a pair of tear lines connecting each web to its associated pair of tubes;

(c) first and second hollow manifolds;

(d) at least two longitudinally spaced portions of the tubes on each mat being torn free of said webs along said pair of tear lines; and

(e) the tube end portions being connected to said manifolds through respective holes in the manifold walls to define closed fluid-conducting paths from the first to the second manifold.

DEFENSIVE PUBLICATIONS

PUBLISHED OCTOBER 4, 1983

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T103,501

DEWATERING OF FLUE GAS DESULFURIZATION SULFITE SOLIDS

Forrest C. Garrison, 510 Central Dr., Apt. 514-A, Chattanooga, Tenn. 37421, and William L. Wells, 3522A Taft Hwy., Signal Mountain, Tenn. 37377

Filed Nov. 24, 1982, Ser. No. 444,127

Int. Cl.[3] C01B *17/00*

U.S. Cl. 423—242

5 Sheets Drawing. 31 Pages Specification

The dewatering capabilities of sulfite sludges from flue gas desulfurization facilities are substantially improved by the addition of relatively small amounts of sodium thiosulfate additive, or additives derived from or related to sodium thiosulfate, into the scrubber slurry liquor. As an added embellishment, these predetermined amounts of said additives are greater than those required for effecting substantial scale inhibition in the scrubber innards. Subsequently, conventional dewatering of the sulfite sludge to about 80 to 90 percent solids directly produces a waste product disposable in both an economically and an environmentally acceptable manner, in that the thixotropic characteristics of such sludges which are associated therewith upwards to about 70-percent solids therein are completely eliminated.

REISSUES

OCTOBER 4, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

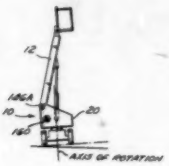
Re. 31,400
SELF PROPELLED AND EXTENSIBLE BOOM

Rallie P. Rallis, Cerritos; Richard E. Cullity, La Mirada, and Lyle R. Tamplin, Anaheim, all of Calif., assignors to Mark Industries, Carson, Calif.

Original No. 4,226,300, dated Oct. 7, 1980, Ser. No. 13,689, Feb. 21, 1979. Application for reissue Oct. 26, 1981, Ser. No. 315,221

Int. Cl.³ B66F *11/04*

U.S. Cl. 182—2 **11 Claims**



14. In a lift, the combination of a self propelled frame;
a boom; and
a body mounted on said frame so as to be selectively rotatable thereon about an axis of rotation; said rotatable body including
(a) a counterwieght body with a center of gravity, said counterweight body being fixed to said rotatable body so as to comprise the peripheral portion thereof which is most remote from the axis of rotation, and
(b) means for pivotally attaching said boom to said rotatable body adjacent to said counterweight body so that the counterweight body center of gravity is always disposed between the boom pivotal attachment and the axis of rotation,
and in which the frame has four wheels rotatably attached thereto, the lift having a track in which is determined thereby, and in which the counterweight body is disposed on the rotatable body with respect to the axis of rotation so that the rotation of the rotatable body rotates the counterweight body center of gravity within the track of the lift.

Re. 31,401
ELECTRONIC TIMEPIECE

Yasuo Kusumoto, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

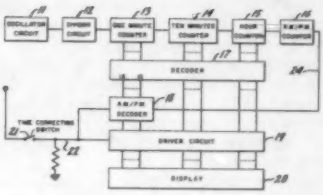
Original No. 4,142,359, dated Mar. 6, 1979, Ser. No. 752,440, Dec. 20, 1976. Application for reissue Mar. 4, 1981, Ser. No. 240,476

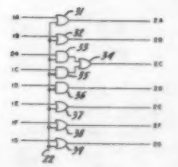
Claims priority, application Japan, Dec. 19, 1975, 50-151665

Int. Cl.³ G04C *19/00*

U.S. Cl. 368—69 **7 Claims**

1. An electronic timepiece, comprising: an oscillator circuit for generating a repetitive time standard signal; a divider circuit receptive of the repetitive time standard signal for dividing the same and for developing a repetitive output signal having a repetition rate defining a unit of time; a time counter circuit connected to receive the dividing circuit output signal for counting the same and for developing a count representative of time; an AM/PM counter circuit connected to said time counter circuit and responsive to the count developed therein for developing a count indicative of whether the time is AM or PM; display means having a plurality of digit display positions for displaying time; decoder means connected to said time counter circuit for developing decoded output signal groups each for enabling a respective digit display position of said display means to enable said display means to display the time represented by the count developed by said time counter circuit; AM/PM decoder means receptive of one decoded output signal group from said decoder means and receptive of a control signal and connected to receive the count developed by said AM/PM counter circuit for developing the applied decoded output signal group as an output signal and *responsive to the control signal* for developing an output signal effective to display a character representative of AM and for developing an output signal effective to display a character representative





of PM according to whether or not the control signal is applied to said AM/PM decoder means and according to whether or not the count developed by said AM/PM counter *circuit* represents AM or PM; *a driving circuit receptive of the decoder means output signal groups for driving said display means to display time and receptive of the output signals developed by said AM/PM decoder means for driving said display means to display characters representative of AM and PM;* and means for *selectively* developing said control signal.

Re. 31,402
ELECTRONIC TIMEPIECE

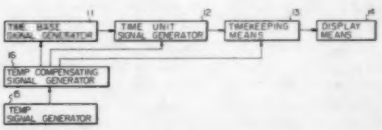
Yukio Hashimoto, Niiza, and Shigeru Morokawa, Higashiyamato, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Original No. 3,978,650, dated Sep. 7, 1976, Ser. No. 517,231, Oct. 23, 1974. Application for reissue Sep. 6, 1978, Ser. No. 939,941

Claims priority, application Japan, Oct. 24, 1973, 48/119605; Oct. 30, 1973, 48/121994; Nov. 15, 1973, 48/128549; Nov. 26, 1973, 48/132379

Int. Cl.³ G04F *5/00*; G04B *17/20*

U.S. Cl. 368—159 **26 Claims**



1. An electronic timepiece which is provided with a time reference signal having an output signal time count unit signal generator, a time counting mechanism and a time display mechanism, the electronic timepiece further comprising:

a temperature signal generator for generating a temperature signal [said generator], *said temperature signal generator being timed to oscillate intermittently by the output signal of said timekeeping means and* including an oscillator circuit having an output different from that of said time reference signal generator, wherein the ratio of output oscillation frequencies changes with temperature variation;

means for transmitting said temperature signal intermittently *in response to the output signal of said timekeeping means*;

memory means for storing the temperature signal generated by said temperature *signal* generator [until a subsequent temperature signal is generated and for delivering said stored temperature signal when the subsequent temperature signal is received by the memory], *said memory means being controlled by the output signal of said timekeeping means so as to keep the temperature signal until a subsequent temperature signal is supplied;*

a signal converter for generating a temperature compensating signal *in response to the temperature signal stored in said memory means*, wherein said compensating signal compensates for the variations of the output frequency of said time reference signal generator caused by temperature variations; and

a time reference signal frequency variable controller for synthesizing the output signal of said time reference signal generator and that of said signal converter by compensating for the changes of the output frequency of said time reference signal generator caused by the temperature variations and for delivering a resultant signal to said time unit signal generator.

Re. 31,403

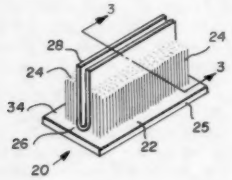
WEATHERSTRIP AND METHOD FOR SEALING A GAP

Allen J. Burrous, Hemlock, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Original No. 4,214,930, dated Jul. 29, 1980, Ser. No. 42,999, May 29, 1979. Application for reissue May 10, 1982, Ser. No. 376,670

Int. Cl.³ D04H *11/00*; E06B *7/22*

U.S. Cl. 156—60 **14 Claims**



1. A weatherstrip for sealing a gap between members movable relative to one another between non-aligned and aligned positions, said weatherstrip comprising:

A. a backing strip for securing said weatherstrip to one of said members;

B. at least one sealing body having one surface portion thereof fixed to one face of said backing strip and extending longitudinally thereof and cooperating therewith for forming a sealing assembly, said sealing body extending from said face toward the other of said members to substantially close said gap between said members; and

C. A flexible film fixed adjacent one edge portion thereof to said sealing assembly with said film transverse to said one face, the opposite free edge portion of said film extending beyond said opposite free surface portion of said sealing body for a substantial distance whereby said free edge portion of said film is bent over at least a part of said free surface portion of said sealing body when said members are moved to said aligned position.

Re. 31,404

METHOD OF PRODUCING UNDERCUT TUBULAR PLASTIC ARTICLES

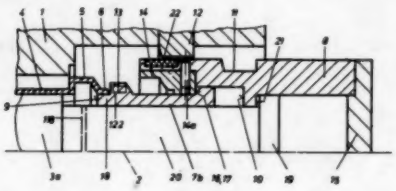
Anton Anger, Linz, Austria, assignor to Österreichische Schiffswerften Aktiengesellschaft Linz-Korneuburg, Linz, Austria

Original No. 4,127,632, dated Nov. 28, 1978, Ser. No. 707,628, Jul. 22, 1976. Application for reissue Sep. 11, 1979, Ser. No. 74,414

Claims priority, application Austria, Jul. 29, 1975, 5878/75; Oct. 10, 1975, 7770/75

Int. Cl.³ B29D *23/00*

U.S. Cl. 264—573 **13 Claims**



1. A method of making a tubular pipe fitting of the type having a longitudinally extending axis and having a predetermined wall thickness throughout and wherein two outer circumferentially extending annular portions having first inner diameters flanking an intermediate circumferentially extending annular portion having a larger second inner diameter defining a circumferentially extending annular groove for receiving a gasket, packing or the like, the difference between the radii of said outer annular portions and the radius of said intermediate annular portion being within a range of more than to at least equal to said thickness, comprising the steps of introducing plasticized synthetic plastic material into a mold whose cavity has a configuration matching that of the fitting, the mold being shiftable between an open position to facilitate removal of the fitting and a closed position to form the cavity and facilitate formation of the fitting, the mold cavity being defined by a core having a first core part for cooperating in forming one of the outer annular portions and a second core part for cooperating in forming the other of the annular portions together with the intermediate annular portion, the core parts being axially shiftable relative to one another between a first position at which the core parts cooperate in forming the mold cavity and second position at which the second core part is adapted to be stripped from the intermediate annular portion of the fitting, the mold cavity also being defined by a first outer mold part radially shiftable between a first position at which it cooperates in forming part of the cavity for one of the outer annular portions and part of the second intermediate annular portion and second radial position away from the fitting to permit stripping of the core, the mold cavity also being defined by a second outer mold part shiftable axially between a first position at which it cooperates in forming part of the cavity for the other of the outer annular portions and the remainder of the intermediate annular portion and a second axial position away from the fitting to permit stripping of the core, the mold cavity surrounds the core including a larger portion with an outer diameter corresponding to said second inner diameter and two smaller portions flanking said larger portion and having outer diameters corresponding to said first diameters whereby the introduced material is converted into said fitting; exposing the exterior of the fitting by shifting the first and second outer mold parts to their respective second position, at least in the region of said intermediate portion and one of said outer portions; maintaining the latter one outer portion of the exposed fitting in a state in which it can undergo elastic deformation; and moving the fitting and the second core part relative to each other in a direction to force the larger portion of the core through said latter one outer portion of the fitting whereby this one outer portion expands during the passage of said larger

portion therethrough and thereupon contracts so that its inner diameter is again less than the inner diameter of said intermediate portion.

9. A method for forming a hollow thermoplastic article, having an enlarged bell end with an inner annular groove therein, and a body portion having at least a longitudinal section thereof of smaller inner diameter than the diameter of said inner annular groove of said bell end, which comprises the steps of:

introducing molten plastic into a hollow article forming mold means including a cavity means and core means which cavity and core means together, in closed position, define said bell end and said body portion, said core means being movable, with respect to said cavity means, from a closed position to at least one partially retracted position and thence to a fully retracted position clear of said cavity means and said cavity means being openable to enable said article to be ejected from said cavity means;

cooling the molten plastic of at least a first part of said body portion, while said mold means is in closed position, to a first temperature range within which said plastic forming said first part of said body portion is substantially rigid and non-deformable and,

cooling the molten plastic forming said bell end, while said mold means is in closed position, to a second temperature range in which said plastic forming said bell end remains resiliently deformable, said second temperature range being substantially higher than said first temperature range;

in sequence, partially retracting said core means to thereby remove said core means defining said bell end with some elastic deformation of said bell end while the plastic forming said bell end lies within said second higher temperature range and is still readily deformable and said first part of said body portion lies within said first lower temperature range and then, fully retracting said core means; and

ejecting said formed thermoplastic article from said cavity means before said bell end has cooled to a substantially rigid condition to allow said bell end to recover to its undeformed shape.

13. A method for forming a thermoplastic article having an enlarged bell end with an inner groove and a body portion having at least a section thereof of smaller inner diameter than the diameter of said inner groove, which comprises the steps of:

heating thermoplastic material to a temperature where said material is resiliently deformable;

molding said material to form said article by disposing the heated thermoplastic material around a first and second molding means, said first molding means forming said bell end of said hollow and said second molding means forming said body portion of said hollow;

cooling said second molding means to cause the thermoplastic material adjacent to said second molding means to cool to a temperature range where said thermoplastic material is substantially rigid and non-deformable;

cooling said first molding means to cause said thermoplastic material adjacent to said first molding means to be cooled to a second temperature range in which said thermoplastic material remains resiliently deformable, said second temperature range being substantially higher than said first temperature range;

withdrawing said first molding means causing elastic deformation of said bell end; and

withdrawing said second molding means and allowing said bell end to recover to its undeformed shape before said bell end has cooled to a substantially rigid condition.

Re. 31,405

CERAMIC FOAM CEMENT

Robert J. Paisley, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Original No. 4,297,140, dated Oct. 27, 1981, Ser. No. 165,647, Jul. 3, 1980. Application for reissue Sep. 29, 1982, Ser. No. 427,682

Int. Cl.³ C04B *33/00*

U.S. Cl. 501—84 **15 Claims**

1. A foamable particulate ceramic cement capable of forming a sintered cordierite foamed ceramic mass and consisting esentially, by weight, of:

1–40% cordierite grog,

99–60% ceramic base material and an effective amount of a foaming agent to effect foaming of the cement upon firing to produce the foamed ceramic mass,

the base material being raw ceramic material that has an analytical molar composition consisting essentially of about:

1.7–2.4 MO·1.2–2.4 Al_2O_3·4.5–5.4 SiO_2 wheein MO and at least 45% MnO, and

the grog being ceramic material that has been previously first and comminuted, and that has an analytical molar composition consisting essentially of about:

1.7–2.4 RO·1.9–2.4 Al_2O_3·4.5–5.2 SiO_2 wherein RO comprises, as mole % of RO, MnO in an amount of 0% up to a mole % that is about 20 mole % lower than the mole % of MO that is MnO and the balance is substantially MgO.

Re. 31,406

OXYGEN PERMEABLE CONTACT LENS COMPOSITION, METHODS AND ARTICLE OF MANUFACTURE

Norman G. Gaylord, New Providence, N.J., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

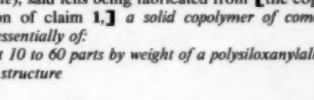
Original No. 3,808,178, dated Apr. 30, 1974, Ser. No. 263,541, Jun. 16, 1972. Continuation of Ser. No. 931,355, Aug. 7, 1978, abandoned. Application for reissue Dec. 11, 1980, Ser. No. 215,486

Int. Cl.³ C08F *230/08;* **G02C** *7/04*

U.S. Cl. 526—279 **18 Claims**

2. As a new article of manufacture, a contact lens having increased oxygen permeability *in comparison with poly(methylmethacrylate)*, said lens being fabricated from [the copolymer composition of claim 1,] *a solid copolymer of comonomers consisting essentially of:*

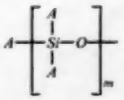
(a) about 10 to 60 parts by weight of a polysiloxanylalkyl ester of the structure



wherein

(1) X and Y are selected from the class consisting of C_1–C_5 alkyl groups, phenyl groups and Z groups,

(2) Z is a group of the structure



(3) A is selected from the class consisting of C_1–C_5 alkyl groups and phenyl groups,

(4) R is selected from the class consisting of methyl groups and hydrogen,

(5) m is an integer from one to five, and

(6) n is an integer from one to three; and

(*b*) *about 40 to 90 parts by weight of an ester of a* C_1–C_{20} *monohydric alkanol and an acid selected from the class consisting of acrylic and methacrylic acids,*

said lens having a refractive index of from 1.35 to 1.50.

3. The contact lens of claim 2 wherein said solid copolymer of comonomers includes as a comonomer a minor amount of a cross-linking monomer.

7. The contact lens of claim 3 wherein said solid copolymer of comonomers includes as a comonomer a minor amount of a wetting monomer.

Re. 31,407

COMPUTER MONITORING SYSTEM

Eugene L. Furtman; Charles B. Ross; Richard D. Ashby, all of McLean, Va., and Steven D. Berliner, San Jose, Calif., assignors to Tesdata Systems Corporation, MacLean, Va.

Original No. 4,166,290, dated Aug. 28, 1979, Ser. No. 904,654, May 10, 1978. Application for reissue Aug. 13, 1980, Ser. No. 177,555

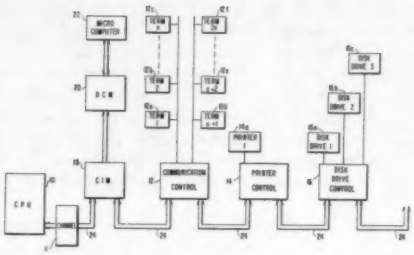
Int. Cl.[3] **G06F** *11/00*

U.S. Cl. 364—200 **23 Claims**

16. A system for monitoring the performance of peripheral devices connected to a central processing unit channel of the type which carries data, addresses, commands, status information and a plurality of condition flags, comprising:

a channel interface module connected as a peripheral device to said channel, said channel interface module comprising data selector means for receiving all said data, address, command and status information on said channel and providing same on a bus line output thereof, a signal level circuit for receiving selected condition flags on said channel and providing condition strobes at an output thereof, an event means for receiving said condition flags and providing input event codes representing selected sequences and combinations of said condition flags; and

a data collection module connected to said channel interface module and receiving all information on said bus line output, said condition strobes and said input event codes, said data



collection module comprising a packet memory for storing packets of information about selected peripheral devices whenever said selected peripheral devices are accessed on the channel, and means responsive to an address on said bus line for selectively controlling the entry of information pertaining to the peripheral device identified by said address into said packet memory.

PLANT PATENTS

GRANTED OCTOBER 4, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,113

MINIATURE ROSE PLANT

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed May 10, 1982, Ser. No. 376,769

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a soft golden tan color, being of a shade generally near Orange Buff 507/3, the bud and flower resembling the variety Over The Rainbow (U.S. Plant Pat. No. 3,472) in form and size but having more petals; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings, with an abundance of flowers borne usually one to the stem.

5,114

ROSE PLANT

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Jan. 25, 1982, Ser. No. 342,120

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded to upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers which resemble Sheri Anne (miniature — U.S. Plant Pat. No. 3,826) in form and color, the flowers of the present variety being born usually in loose sprays on relatively long stems (sometimes born singly) suitable for cutting, the flowers retaining good color and quality for several days as cut flowers; and further characterized by a vigorous healthy plant with semi-glossy to matt foliage, the plant being easy to propagate from softwood cuttings and by budding.

5,115

MINIATURE ROSE PLANT

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed May 10, 1982, Ser. No. 376,289

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of a rich dark red color, being of a shade generally near Chrysanthemum Crimson 824/1, the buds and flowers resembling the variety Beauty Secret (not patented) in form and size but being darker red in color; and further characterized by a plant of vigorous and compact growth habit, easy to propagate from cuttings, with an abundance of small to medium size semi-glossy to matt foliage and an abundance of flowers borne usually singly on rather stiff wirey stems.

5,116

BUTTERNUT TREE—LOUMIS CULTIVAR

William K. Erickson, Bowling Green, Mo., assignor to Stark Brothers Nurseries and Orchards Company, Louisiana, Mo.

Filed Feb. 2, 1982, Ser. No. 345,098

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of *Juglans cinerea,* substantially as illustrated and described, characterized by (a) the formation of a large tree of medium vigor, (b) extremely high nut productivity wherein average sized nuts are frequently borne in clusters of approximately five or more, (c) the propensity for the nuts to readily separate from the hull when opened, (d) the formation of buds which exhibit good winter hardiness, (e) the formation of flowers which exhibit good resistance to frost, (f) the relative absence of damage by casebearer insects, and (g) resistance to Witches'-Broom disease.

PATENTS

GRANTED OCT. 4, 1983

ERRATA

For CLASS	See PATENT NO.
073–046	4,407,171
089–001	4,407,180
604–020	4,407,282
604–136	4,407,283
604–385	4,407,284
383–005	4,407,443
502–025	4,407,725
502–161	4,407,726
502–115	4,407,727
502–060	4,407,728
502–200	4,407,729
502–208	4,407,730
502–203	4,407,731
502–208	4,407,732
502–174	4,407,733
502–009	4,407,734
502–010	4,407,735
502–230	4,407,736
502–243	4,407,737
502–334	4,407,738
428–010	4,407,780
381–120	4,408,094
381–024	4,408,095
381–107	4,408,096
381–015	4,408,097
381–011	4,408,098
377–002	4,408,118
324–065	4,408,128
382–061	4,408,181
360–074	4,408,317
372–098	4,408,334

PATENTS

GRANTED OCTOBER 4, 1983

GENERAL AND MECHANICAL

4,407,021

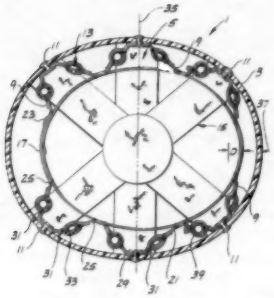
SUSPENSION SYSTEM FOR HEADGEAR

Douglas R. Kralik, and Hal D. Mitchell, both of Rolla, Mo., assignors to Figgie International Inc., Willoughby, Ohio

Filed Mar. 30, 1981, Ser. No. 249,114

Int. Cl.³ A42B *3/02*

U.S. Cl. 2—416 **15 Claims**



1. A suspension system for the skirt of protective headgear having an outer shell, said system comprising a head band adapted to fit around a wearer's head, and a plurality of tension members secured at ends thereof, constituting their outer ends, to the shell at spaced intervals around the inner surface of the shell adjacent the skirt thereof and at their inner ends to the head band at spaced intervals therealong for holding the head band spaced from the inner surface of the shell, each tension member being formed of inelastic and relatively inextensible strips material, with a portion of the strip material being formed for permitting extension and contraction of the tension member and having elastically deformable means associated therewith for enabling extension of the tension member within a limited range of extension upon tensioning thereof, whereby with the headgear worn by a wearer and upon application of an impact load to the front, back, or sides of the headgear, the shell moves relative to the head in the direction of the force with resultant tensioning and elongation of certain of the tension members, the range of elongation of the tension members being such as to prevent engagement of the shell with the wearer's head and the elastically deformable means of the elongated tension members deforming to attenuate the shock upon the wearer from the applied load, and whereby, upon termination of the impact load, the elongated tension members contract and the shell is moved in the opposite direction relative to the head, each tension member having a transversely extending pocket receiving the respective elastically deformable means therein, said deformable means being laterally squeezed upon extension of the tension member from an unstressed condition in which it holds the sides of the pocket apart to a generally flattened condition enabling elongation of the tension member, said tension members being constituted by a single relatively long length of said strip material secured to the shell and the head band at spaced intervals, and a plurality of relatively short lengths of said strip material, one short length for each pair of adjacent tension members, stitched to said relatively long length of strip material to form said pockets, one for each tension member.

4,407,022

FEMUR COMPONENT FOR AN ARTIFICIAL HIP JOINT

Gunther Heimke, Weinheim, and Peter Griss, Plankstadt, both of Fed. Rep. of Germany, assignors to Steinzeug- und Kunststoffwerke Friedrichsfeld GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 63,681, Aug. 6, 1979, abandoned. This application Jun. 16, 1981, Ser. No. 274,208

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834155

Int. Cl.³ A61F *1/03*

U.S. Cl. 3—1.913 **9 Claims**

1. An artifical hip joint having an elongated shaft to be anchored in a femur without the use of cement, the cross-sectional outline of said shaft being generally rectangular, two of the oppositely disposed sides of said shaft being each provided with at least two outwardly projecting force-transmitting steps, the remaining two opposite sides of the shaft being smooth, each of the two steps on each of the opposite sides of the shaft being transversely inclined with respect to a plane which passes through the axis of the shaft and which is generally parallel with the planes of the smooth sides of the shaft in equal and opposite directions with respect to each other and said plane to transmit components of compression forces to the tissue of the femur to prevent rotation of the shaft about its long axis, and also in the direction of the shaft axis.

4,407,023

TWO-PIECE SNAP-TOGETHER FLOOR AND CEILING PLATE

C. W. Norton, 4032 Hampstead Rd., La Canada-Flintridge, Calif. 91011

Filed Jun. 29, 1981, Ser. No. 278,633

Int. Cl.³ E03C *1/04*; F16L *5/00*

U.S. Cl. 4—191 **2 Claims**

1. A plumbing sealing device, comprising:

oppositely positioned first and second separate sections, each of said sections having a notch defined substantially in the center thereof,

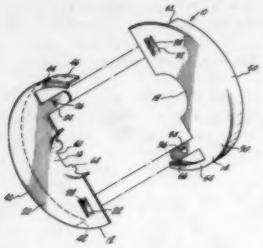
each of said sections having a face portion,

a downwardly extending wall integral with each of said face portions,

said walls disposed at an angle to said face portions, a sleeve integral with each of said face portions of said sections,

a flange extending outwardly from the face portion of each of said sections,

a securing means integral with each of said flanges,



whereby said flanges are adapted to fit within said sleeves defined in said face portions to occasion connection of said first and second sections.

4,407,024

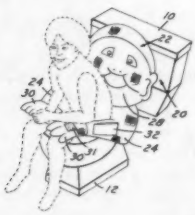
TOILET SEAT LID COVER

Helga Schneider, 3865 Spanish Oaks Dr., West Bloomfield, Mich. 48033

Filed Dec. 23, 1981, Ser. No. 333,673

Int. Cl.³ A47K *13/14*

U.S. Cl. 4—242 **6 Claims**



1. A toilet seat lid cover comprising a pocket adapted to be removably secured as a cover over a toilet seat lid and a pair of generally arcuate laterally opposed shape-retaining flexible arms extending from an open edge of said pocket, said arms being of arcuate configuration and length so as to be adapted to lie upon and substantially cover a toilet seat with said pocket removably secured over the toilet seat lid and the lid in the raised position.

4,407,025

WATER-CONSERVING TOILET

Arnold Hennessy, 182 Niles St., Wellington, Ontario, Canada K0K 3L0, and John D. Inch, P.O. Box 118, Lansdowne, Ontario, Canada

Continuation of Ser. No. 90,370, Nov. 1, 1979, Pat. No. 4,310,934. This application Jan. 4, 1982, Ser. No. 336,809

Claims priority, application Canada, Nov. 14, 1978, 316190

Int. Cl.³ E03D *1/00, 1/08, 3/10, 11/02*

U.S. Cl. 4—321 **10 Claims**

1. A toilet which includes:

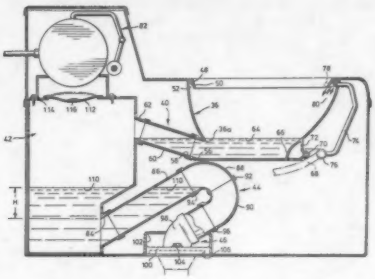
a bowl for receiving waste;

a waste outlet extending laterally from the bowl and defining a first, shallow trap arranged so that a relatively shallow body of liquid is normally retained in the bowl for preventing gaseous communication through the trap;

a flush system arranged, when operated, to deliver a charge of flushing liquid into the bowl in a direction to cause said body of liquid and waste to be discharged through said outlet;

an enlarged chamber communicating with said bowl outlet for receiving waste from said bowl;

an outlet extending outwardly from said chamber and adapted for connection to a sewer inlet, said chamber



outlet defining a second trap of substantial height capable of preventing reverse flow of sewer gas into said chamber in use; and,

means communicating with said chamber and adapted to relieve increasing gas pressure caused by liquid entering the chamber from the bowl, whereby back pressure resistance to flushing of liquid from the bowl is reduced.

4,407,026

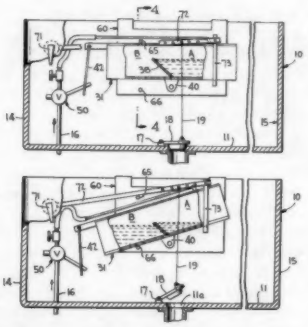
FLUSH CONTROL MECHANISM FOR TOILET TANK

Robert E. Myers, 1446 Fourth St., Monongahela, Pa. 15063

Filed Aug. 4, 1982, Ser. No. 405,157

Int. Cl.³ E03D *1/02*

U.S. Cl. 4—365 **10 Claims**



1. A reliable and easily adjusted flush control mechanism for a toilet tank which includes a drainage opening, a stopper for the drainage opening, a trip chord attached to the stopper and a main water supply pipe, said flush control mechanism including a pivotable control element, a manually-operable trip lever mechanism, a fill water valve element and an adjustable valve element,

said pivotable control element comprising (a) a weightbox which is pivotally mountable about a generally horizontal axis located above the main water level in the toilet tank, said weightbox including a baffle which extends traversely therein to divide the interior into a water inlet chamber and a water outlet chamber, a drain hole which communicates with the water outlet chamber, a vent hole, and a water inlet hole which communicates with the

water inlet chamber; (b) an attachment means to enable the weightbox to rotate about the generally horizontal axis, (c) a connector means for connecting the weightbox to the control arm of the fill water valve element, and (d) a fresh water infill tube which connects the water inlet hole with a secondary nozzle of the fill water valve element,

said manually-operable trip lever mechanism including a trip lever arm which extends within the toilet tank and to which the trip chord is attached, and a lifting arm which is located within the toilet tank and is capable of rotating the weightbox about the generally horizontal axis;

said fill water valve element being connectable with the main water supply pipe and nozzle for delivering fresh water directly into the toilet tank, a secondary nozzle for connection with the fresh water infill tube of the pivotable control element, and a control arm which opens or closes both said primary and secondary nozzles and is connectable with the connector means of the pivotable control element; and

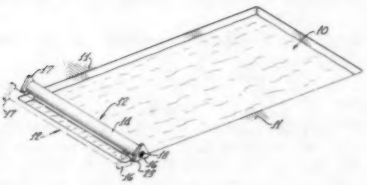
said adjustment valve element being connected between the secondary nozzle of the fill water valve element and the weightbox of the pivotable control element for adjusting the flow of fresh water from the fill water valve element to the water inlet chamber of the weightbox.

4,407,027

POOL-COVER APPARATUS AND METHOD

George M. Colon, Jr., 32072 Sea Island Dr., Laguna Niguel, Calif. 92677

Filed Aug. 10, 1981, Ser. No. 291,512
Int. Cl.³ E04H *7/02*
U.S. Cl. 4—502 **14 Claims**



1. A pool-cover apparatus which comprises:

(a) an elongated roller element adapted to have a flexible pool cover wrapper therearound,

(b) first and second end frames,

(c) means to rotatably connect the ends of said roller element to said respective end frames, and

(d) first and second wheels rotatably mounted on each of said end frames at regions spaced from the regions of connection of said roller-element ends to said end frames said wheels being located and mounted in one surface of each of said frames so that the entire pool-cover apparatus may be pushed along the decking from a storage area to a location adjacent the pool, with only said wheels contacting the decking and rolling therealong,

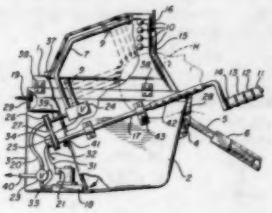
(e) each of said frames providing a second surface angularly spaced from said first surface whereby each of said frames may be manually tilted to a braking position at which said wheels are removed from engagement with the decking, and said second surface is engaged with said decking, said regions of connection of said roller-element ends to said end frames are so located that, when said frames are in their tilted braking positions, said roller element and pool cover may rotate freely so as to unwind said pool cover.

4,407,028

ENERGY WATER-SAVER HOME SHAMPOOER

William D. Nolan, 3100 Grant St., Wichita Falls, Tex. 76308

Filed Feb. 13, 1981, Ser. No. 234,254
Int. Cl.³ A54D *19/04*
U.S. Cl. 4—516 **3 Claims**



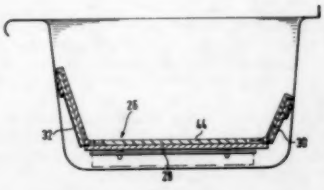
1. Apparatus for applying solutions to the human head comprising: a cabinet with an upper closure mounted on a lower housing having front, rear, side walls and means for mounting said cabinet on a support structure, said front wall having inclined means mounted thereon to support the back of the user in a semi reclining position, said front wall having a cutout surface area adapted to receive and support the user's head and neck in a desired position within the cabinet, in further combination with a liquid resevoir in said housing and means for pumping liquid from said resevoir to a valve mounted externally of the rear wall of said housing, in further combination with a conduit connecting said valve with a second valve inside said cabinet connected to lower and upper applicators via a manifold, in further combination with rotating means causing circular movement of said applicators about the user's head, in further combination with a handle located adjacent said front wall for operating said rotating means whereby the user may rotate the applicators to any desired position as desired, in still further combination with valve actuator means to selectively control via said second valve the application of liquid from said lower applicator and said upper applicator, said actuator means being located in said handle, in further combination with a baffle mounted on said closure for resting on the user's face and pivoted means for pivoting the closure from an open to closed position.

4,407,029

RECLINING PLATFORM FOR BATHTUB UNITS

Peter Schmidt, D-7989 Enkenhofen, Gde. Argenbühl, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,055
Claims priority, application European Pat. Off., Apr. 3, 1982, 82102874
Int. Cl.³ A47K *3/12*
U.S. Cl. 4—564 **10 Claims**



1. A reclining platform for bathtub units, of the type having a base, a bracket plate, and a lift frame and lift device positioned between the base and bracket plate, the reclining platform comprising an oblong, essentially retangular base plate

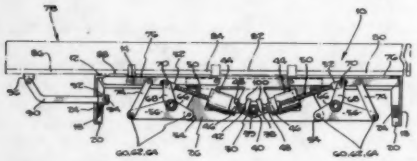
extended in a plane and four hinged plates positioned at front and side edges of the base plane and pivotable upward; one front hinged plate being wider, measured in the longitudinal direction of the base plate, than the front hinged plate opposite it; spring means holding all of the hinged plates close to the base plate for urging the hinged plates to lie at least approximately on a common plane that coincides with the plane of base plate; every two adjacent hinged plates having recesses therebetween and wedges at least partially filled into the recesses, said wedges being flexible.

4,407,030

SAFETY DEVICE FOR AN ADJUSTABLE BED

Franklin E. Elliott, Torrance, Calif., assignor to Maxwell Products, Inc., Cerritos, Calif.

Filed Feb. 9, 1981, Ser. No. 233,007
Int. Cl.[3] A61G 7/00
U.S. Cl. 5—66 15 Claims



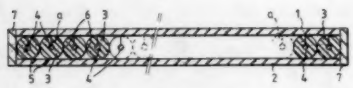
1. A safety device for an adjustable bed comprising:
means for adjusting said bed including linkage means subjected to a mechanical force;
an electric motor for driving said linkage means;
a connector plate for connecting said motor to said adjustable bed; and
a sensing element mounted upon said connector plate for engaging said electrical motor and for undergoing a change of state as said mechanical force applied to said linkage means undergoes a change of state, whereby said motor is disabled upon a change of said mechanical force.

4,407,031

ELASTOMER MATTRESS WITH STIFFENER ELEMENTS

August Michiels, Duprestraat 123, B-1090 Jette-Brussels, Belgium

Filed Jan. 7, 1981, Ser. No. 223,147
Claims priority, application Belgium, Jan. 11, 1980, 198934
Int. Cl.[3] A47C 27/16
U.S. Cl. 5—462 7 Claims



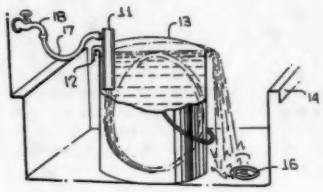
1. In a mattress comprising a pair of spacially displaced elastomer sheets, said sheets cooperating with end members to define a chamber having a longitudinal axis and being of substantially constant depth between said sheets, the improvement comprising:
inner members disposed within said chamber, said inner members being comprised of elastomeric material and extending generally transverse to the longitudinal axis of the chamber, said inner members defining a pair of oppositely disposed surfaces having an undulating contour, said undulating surfaces contacting the inwardly facing surfaces of said sheets in a plurality of spacially displaced regions which extend between said end members, the regions of maximum height on each of said inner member undulating surfaces lying in planes which are substantially transverse to the chamber axis, said inner members further including stiffener elements contained therein and extending in a direction transverse to said chamber axis.

4,407,032

WASHING METHOD USING A FLUIDIC OSCILLATOR

Peter Bauer, Germantown, and Julian Lazrus, Bethesda, both of Md., assignors to Bowles Fluidics Corporation, Silver Spring, Md.

Division of Ser. No. 136,860, Apr. 3, 1980, Pat. No. 4,325,235, which is a division of Ser. No. 576,713, May 12, 1975, Pat. No. 4,227,550, which is a division of Ser. No. 356,416, May 2, 1973, abandoned. This application Dec. 17, 1981, Ser. No. 331,849
Int. Cl.[3] D06F 7/00, 39/06
U.S. Cl. 8—158 8 Claims



1. The method of washing clothes in a body of wash liquid comprising the steps of:
(a) inducing amd maintaining a continuous circulating flow in a vertical plane in said body of liquid, said flow being sufficiently strong to carry and circulate articles therewith;
(b) agitating articles carried by said flow at least once during each circulation by introducing pressurized pulses of liquid into the path of said flow;
(c) continuously overflowing surface liquid from said body of liquid; and
(d) discharging the overflowing liquid from the circulating water.

4,407,033

COMBINATION TOE AND SIDE LASTING MACHINE

Derek H. Garner; Frank C. Price, both of Leicester; Philip Reader, Thornton; David W. Whittingham, Blaby; Anthony M. White, Oadby; Joseph A. Shutt, Rearsby, and Nicholas J. Campling, Loughborough, all of England, assignors to USM Corporation, Farmington, Conn.

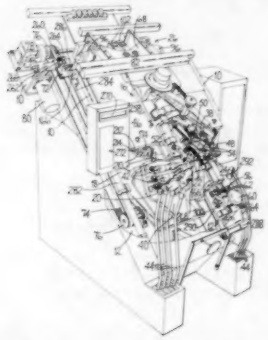
Filed Dec. 18, 1981, Ser. No. 332,253
Claims priority, application United Kingdom, Dec. 20, 1980, 8040923
Int. Cl.[3] A43D 21/00, 3/00
U.S. Cl. 12—10.1 29 Claims

1. A machine for performing a combined toe and side lasting operation on shoe uppers, comprising
a last support, for supporting, bottom facing down, a last on which a shoe upper and insole are assembled,
a plurality of grippers arranged about last support for gripping material portions of an upper and tensioning it about its last,
and toe end lasting means, comprising wiper plates by which lasting marginal portions of the toe region of the upper can be wiped over and pressed against corresponding marginal portions of the insole, wherein the last support and grippers are mounted on a support arrangement which is bodily movable between an operative position, in which a last, with an upper tensioned thereon as aforesaid, is supported with the shoe bottom in a wiping plane (as determined by the wiper plates), and an out-of-the-way position, and further wherein, with the support arrangement in its operative position, the toe end lasting means is

caused to operate to move the wiper plates to an "interrupt" position in which leading marginal portions thereof engage and clamp marginal portions of the upper against corresponding marginal portions of the insole in the region of the periphery of the insole only, the grippers being caused to release the upper as it is so clamped, and the machine also comprising

two side lasting assemblies by which lasting marginal portions of the opposite side regions of the upper can be wiped over and pressed against corresponding marginal portions of the insole, and

adhesive applying means, comprising two nozzles, movable relative to the shoe bottom whereby to cause adhesive to be applied progressively between the lasting marginal portions of the upper and corresponding marginal portions of the insole, in which machine the nozzles are mounted on a further support arrangement which is movable, beneath the level of the toe end lasting means, along a rectilinear path to cause the nozzles supported thereby to apply adhesive progressively along toe and side portions of the shoe bottom, after the inwiping movement of the wiper plates has been interrupted, and prior to such movement being continued, and also prior to operation of the side lasting assemblies, the support arrangement for the last support and grippers being mounted for movement heightwise of the machine between its operative and out-of-the-way positions, and said further support arrangement for the nozzles being movable as aforesaid when the first-mentioned support arrangement has been moved to its out-of-the-way position.



4,407,034

MANUFACTURE OF SHOES

George T. Ralphs, Bradford-on-Avon, England, assignor to C & J Clark Limited, Street, England

Filed Jul. 7, 1980, Ser. No. 166,113

Claims priority, application United Kingdom, Apr. 21, 1980, 801307

Int. Cl.³ A43D *9/00, 13/08*

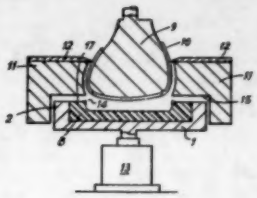
U.S. Cl. 12—142 RS **9 Claims**

1. A process for manufacturing shoes comprising the steps of:

(1) moulding an out-sole having a raised peripheral portion by injection of a first substance in a first cavity defined between a sole mould having a peripheral rim and a lid, said raised marginal portion extending above said rim of said sole mould;

(2) providing a lasted upper spaced from said out-sole;

(3) moving side moulds having a surface facing said raised portion of said out-sole over said rim of said sole mould while said out-sole is positioned in said sole mould so that said surface of said side moulds sealingly engages said raised margin portion to form a sealed joint between said rim of said sole mould and said surface and to define a second cavity formed by said lasted upper, said out-sole and said side moulds; and



(4) joining said lasted upper to said out-sole by injecting a second substance into said second cavity.

4,407,035

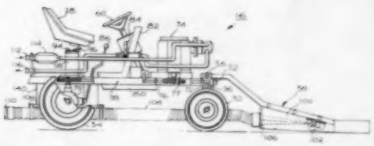
MODULARIZED PNEUMATIC TRACTOR WITH DEBRIS LIQUEFIER

Albert Lindqvist, P.O. Box 2606, Christiansted, St. Croix, V.I. 00820

Filed Apr. 30, 1982, Ser. No. 373,412

Int. Cl.³ B08B *9/08*

U.S. Cl. 15—3 **10 Claims**



1. A modularized tractor including:

a main chassis;

seat, left back wheel, right back wheel, front wheel assembly, and scoop assembly modules;

means for removably connecting said modules to said main chassis;

a pneumatic motor carried by said main chassis;

pneumatic tube means coupled to said motor and adapted for coupling to a source of compressed air;

means coupling said pneumatic motor to said left and right back wheels for moving said tractor;

means carried by said main chassis and coupled to said front wheel assembly for steering such assembly; said scoop assembly comprising a scoop which is enclosed except for a sludge inlet opening and a liquefied sludge outlet opening opposed to said inlet opening;

at least one jet orifice supported inside said scoop and directed at said sludge outlet opening;

an exhaust tube having first and second ends, said first end being coupled across said outlet opening in said scoop to receive the outflow from said scoop, said second end being adapted for coupling to an exhaust pump; and,

tube means coupled to said at least one jet orifice and adapted for coupling to a source of hydraulic fluid at high pressure.

4,407,036

APPARATUS FOR REMOVAL OF MOLD FROM THE EXTERIOR OF MEAT PRODUCTS

Henry Y. Kuhl, Kuhl Rd., Flemington, N.J. 08822

Filed Jul. 9, 1982, Ser. No. 396,963

Int. Cl.³ A22C *17/08*

U.S. Cl. 15—3.13 **10 Claims**

10. An apparatus for removal of mold from the exterior of meat products comprising:

(a) a conveyor means extending longitudinally adapted to

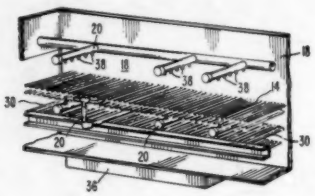
carry meat products for processing thereof to effect removal of mold from the exterior thereof, said conveyor means further including:

(1) a lower conveyor member extending approximately horizontally and longitudinally to support meat products thereabove for processing, said lower conveyor member including and endless wire belt conveyor;

(2) an upper conveyor member extending approximately horizontally and longitudinally above said lower conveyor member and the meat products traveling thereon, said upper conveyor member including an endless wire belt conveyor, said upper conveyor member moving at approximately the same rate of speed as said lower conveyor member, said upper conveyor member adapted to rest upon the upper surface of the meat products and said lower conveyor means to hold the meat products in place during processing thereof by gravitational weight of said upper conveyor member thereon;

(b) an entry station adjacent said conveyor means adapted to be the location of initial placement of meat products thereon;

(c) a cleaning station positioned along said conveyor means at a location adjacent to and downstream from said entry station, said cleaning station including a refrigerated water



delivery means adapted to spray refrigerated water under pressure onto the meat products to remove any mold adhering to the exterior thereof, said cleaning station including a tank means positioned below said conveyor means to hold and recirculate refrigerated water, said refrigerated water delivery means being adapted to maintain the water at 65°–75° F., said refrigerated water delivery means including a plurality of nozzles deployed in an array completely surrounding said conveyor means and the meat products traveling thereon;

(d) an air station positioned along said conveyor means at a location adjacent to and downstream from said cleaning station, said air station adapted to blow air under pressure over meat products traveling upon said conveyor means for drying thereof;

(e) a heating station positioned along said conveyor means at a location adjacent to and downstream from said air station, said heating station adapted to blow heated air under pressure over meat products traveling upon said conveyor means to complete drying and warming thereof; and

(f) an exit station positioned along said conveyor means at a location adjacent to and downstream from said heating station, said exit station providing the location for removal of cleaned meat products.

4,407,037

MOLD CLEANING APPARATUS

Mern S. Kemble, 130 Entrance Dr., New Kensington, Pa. 15068

Filed Aug. 25, 1981, Ser. No. 296,063

Int. Cl.³ B08B *9/08*

U.S. Cl. 15—93 R **21 Claims**

1. A mold cleaning apparatus comprising:

cutter assembly means for removing undesired material from said mold;

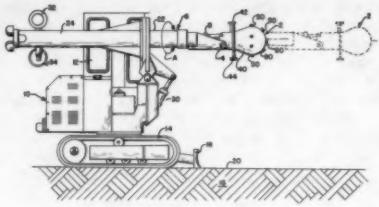
boom means pivotally supporting said cutter assembly;

said cutter assembly means including a shaft member, a plurality of generally radially projecting cutter members fixedly secured to said shaft, said cutter members having a cutter blade mounted at the outer extremity thereof;

each of said cutter members having a resilient connecting link interposed between said cutter blade and said shaft;

power means for effecting axial rotation of said shaft;

mounting means securing said cutter members to said shaft;



said resilient connecting links having one end portion secured to a said cutter blade and another end portion secured to said mounting means;

said mounting means having a series of mounting members secured to said shaft member at axially spaced positions; and

each said mounting member connecting a plurality of said cutter members to said shaft.

4,407,038

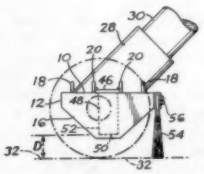
MAGNETIC SWEEPER

Gerald A. Haase, 1005 Country Club Rd., Lake Oswego, Oreg. 97034

Filed Nov. 27, 1981, Ser. No. 325,230

Int. Cl.³ B03C *1/30;* **H01F** *7/02*

U.S. Cl. 15—105 **3 Claims**



1. A magnetic sweeper, comprising:

(a) a transversely elongated, unitary non-magnetic body having an outwardly projecting handle member centrally mounted on its top surface,

(b) the body configured with at least one magnet retaining pocket on each side of the handle, each pcoket having an open side for removable reception of a permanent magnet,

(c) each magnet configured with one side surface having a given area and a second side surface disposed 90 degrees relative to the first side and having a larger surface area, and

(d) wheels on the opposite ends of the body mounted for rotation on a transverse axis,

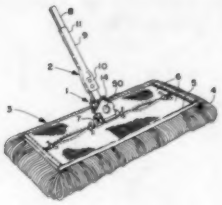
(e) the pockets on said body arranged to support said one side surface of each magnet a predetermined distance inward of the outer circumference of the wheels and the second, larger side surface a predetermined greater distance inward of the outer circumference of the wheels, whereby in one position of the body the said one side surfaces of the magnets are positioned in a predetermined distance above and facing an underlying surface to be swept, and in a second position of the body, rotated 90 degrees from said first position, the said larger second side surface of the magnets are positioned a predetermined greater distance above and facing an underlying surface to be swept.

4,407,039

DUST MOP HANDLE ATTACHMENT DEVICE

Theron V. Moss, Cleveland, Tenn., assignor to SECO Industries, Inc., Cleveland, Tenn.

Filed Sep. 20, 1976, Ser. No. 724,956
Int. Cl.³ B25G 3/24
U.S. Cl. 15—144 A 2 Claims



1. A device for attaching a handle to an accessible shaft of a dust mop frame, comprising:

a plate-like clip member having an integral forwardly extending leg and a pair of integral tab-like portions laterally positioned respectively on opposite sides of said leg with said leg located laterally between said tab-like portions, said tab-like portions being offset relative to said leg to define the effective boundaries of a space that is relatively open at the forward-most end of said space for receiving the shaft,

closure means mounted for movement relative to said clip member and cooperable with said leg and tab-like portions thereof for closing said open forward-most end of said space thereby to hold the shaft in said space, and

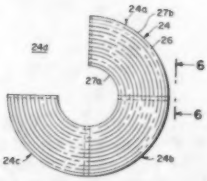
mounting means extending generally rearwardly of said clip member for mounting said clip member to a handle, said mounting means comprising a rigid connector member having at least one opening therein, and further comprising tubular connector means for coupling said connector member at said at least one opening, said means for connecting comprising a portion of said tubular connector means mechanically deformed into said at least one opening, said at least one opening extending through said rigid member, and said portion at least substantially filling a cross-sectional area extent of said opening.

4,407,040

PAD DRIVE FOR ROTARY SCRUBBER

Stephen Scharf, Melville, N.Y., assignor to Universal Brush Company Ltd., Babylon, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,180
Int. Cl.³ B24B 29/00
U.S. Cl. 15—230.17 21 Claims



1. A pad drive assembly for detachably gripping a selected maintenance pad to be rotatably driven by a floor maintenance machine comprising

a rigid, substantially circular back support defined by two faces, one of which is substantially planar and a substantially rigid pad drive of substantially planar configuration comprised of a plurality of mating sectors and defined by two substantially planar faces,

one of the last mentioned planar faces being attached to said one face of said back support for rotation therewith,

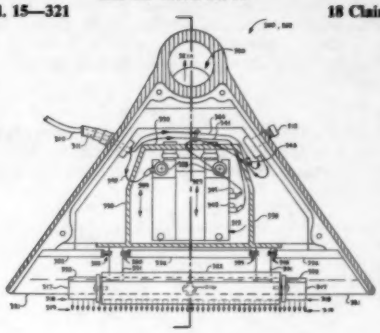
the other planar face of said pad drive being formed with a plurality of upstanding, substantially rigid pins that extend therefrom and that are adapted detachably to grip a selected maintenance pad and rotatably drive the same.

4,407,041

CLEANING SYSTEM HAVING IMPROVED CLEANING SOLUTION RECOVERY

Aaron Goldsmith, 21821 Burbank Blvd., Woodland Hills, Calif. 91367

Continuation of Ser. No. 162,577, Jun. 24, 1980, Pat. No. 4,385,413. This application Jul. 31, 1980, Ser. No. 174,270
Int. Cl.³ A47L 11/00
U.S. Cl. 15—321 18 Claims



1. A carpet cleaning system comprising:

means for agitating a surface to be cleaned, including beater means for agitating the carpet being cleaned;

means for dispensing a cleaning fluid on the surface to be cleaned, including means for dispensing the agitated cleaning fluid from said beater means to provide acceleration between the agitated cleaning fluid being dispensed and the carpet being cleaned;

means for recovering the cleaning fluid dispensed by said dispensing means; and

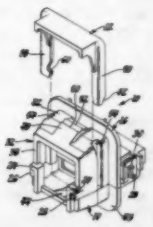
means for mounting said dispensing means next to said recovery means.

4,407,042

GROMMET ASSEMBLY WITH PANEL ATTACHING MEANS

Stephan H. Schramme, Cortland, and Mark A. Kelley, Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 2, 1981, Ser. No. 307,769
Int. Cl.³ H01B 17/14; H02B 1/10; F16L 5/02
U.S. Cl. 16—2 4 Claims



1. A grommet assembly having means for attaching the

grommet assembly to an apertured bulkhead panel or the like comprising;

a shank which is insertable into a panel aperture and which has a rearward portion sized so as to substantially locate the shank horizontally and vertically in the aperture,

a flange at a rearward end of the shank for locating the rearward portion of the shank in the panel aperture,

a rigid projection at one side of the shank which is spaced from the flange for engaging a backside of the panel,

a flexible arm opposite the rigid projection which is attached to a forward end of the shank and projects toward the flange,

said flexible arm having longitudinally spaced projections for engaging the backside of the panel,

a pair of slots in the shank which are spaced from and generally parallel to the flange, and

a U-shaped retainer which slides into the pair of slots and which has portions for engaging the backside of the panel and securely fastening the grommet assembly to the panel.

4,407,043

UNDER CARRIAGES FOR SLIDING DOORS HAVING SYMMETRICAL WEIGHT DISTRIBUTION

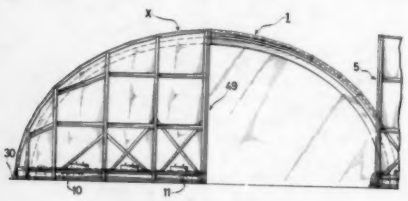
Erwin Möllmann, Neueromasch 6, 4520 Melle 1, Fed. Rep. of Germany

Filed Jan. 13, 1981, Ser. No. 224,660

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001341

Int. Cl.³ E05D *13/02*

U.S. Cl. 16—100 **5 Claims**



1. Under carriages in combination with and for supporting and displacing heavy-weight sliding doors at two spaced positions, said carriages arranged to run on a trackrail embedded in concrete, each of said carriages comprising two track wheels situated one behind another upon the trackrail, each of said track wheels having flanges to overlap the trackrail on both sides thereof, a rigid beam engaging each of said track wheels, and having a spheroidal seat bearing in a central point thereof between said two track wheels, a calotte having a plane upper surface and engaging said spheroidal seat bearing, and each of the sliding doors having a frame provided with a recess for receiving loosely the plane upper surface of said calotte, so as to secure an entraining connection between each of the sliding doors and a respective one of said carriages, whereby each of said carriages bearing a corresponding portion of the heavy-weight of the sliding doors.

4,407,044

HINGE

Kazuo Iseki, Tokyo, Japan, assignor to Ohta Company Limited, Tokyo, Japan

Division of Ser. No. 178,427, Aug. 15, 1980, Pat. No. 4,347,645. This application Nov. 20, 1981, Ser. No. 323,596

Claims priority, application Japan, Aug. 18, 1979, 54-113966[U]; May 6, 1980, 55-61637[U]

Int. Cl.³ E05D *7/04*

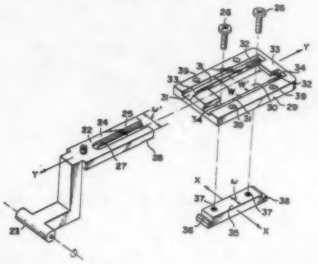
U.S. Cl. 16—237 **7 Claims**

1. A hinge comprising:

a stationary base for mounting directly to a furniture wall, said base being formed centrally with an opening;

a central insert which is smaller in width than said opening, said insert having a pair of transversely extending and upwardly facing projections, and being fitted in said opening at the bottom of said base;

a pair of projections extending inwardly from the transverse edges of said opening, and each formed with a downwardly facing groove in which one of said projections of said insert is engaged slidably;



said base having a pair of arm receiving grooves each formed with a plurality of teeth therein;

an L-shaped arm having a bifurcated portion slidably received in said arm receiving grooves, formed with a plurality of teeth engaged with said teeth in said arm receiving grooves, and defining an elongated slot therein; and

a plurality of screws extending through said slot, and threadedly connected with said insert, whereby said arm is movable in four longitudinal and transverse directions for fine positional adjustment relative to said base.

4,407,045

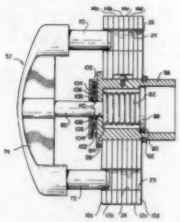
LADDER HINGE AND MULTI-POSITION LOCKING MECHANISM THEREFOR

Leland H. Boothe, 247 South 600 East, Alpine, Utah 84003

Filed Dec. 21, 1981, Ser. No. 333,229

Int. Cl.³ E05D *11/10*; **F16C** *11/10*

U.S. Cl. 16—327 **28 Claims**



1. An improved hinge for collapsible ladders, said hinge being of the type wherein first and second members each have a head portion and a ladder stringer-engaging portion, the first and second members being pivotally engaged for rotation about a pivot axis extending generally perpendicularly through said head portions and having respective first locking apertures which are radially spaced from the pivot axis and can be selectively aligned and mis-aligned by mutual rotation of said first and second member about the pivot axis, and at least one locking pin which is selectively translated through the locking apertures, when aligned, from an unlocked to a locked position thereby preventing mutual rotation of the first and second members, the improved hinge further comprising:

a hub member having a longitudinal axis corresponding to the pivot axis and having a guide aperture defined therein about the longitudinal axis;

a guide shaft disposed in the hub member for both axially slidable translation between extended and retracted positions along the longitudinal axis through the guide aperture and rotation about the longitudinal axis;

a handle member securing together the guide shaft and a proximal end of the locking pin such that a distal end of the locking pin is translatable through the locking apertures when aligned;

bias means for applying an axial bias force to the guide shaft to urge the guide shaft toward the retracted position;

axial detent means responsive to the guide shaft being moved to its extended position for maintaining the guide shaft in the extended position in opposition to the bias force while permitting rotation of the guide shaft, the detent means comprising:

a first detent bore defined through one of said hub member and said guide shaft and at least a first detent recess defined in the other of said hub member and said guide shaft such that said first detent bore and first recess are axially aligned when the guide shaft is in the extended position and are angularly aligned when the locking apertures in said first and second members are aligned;

a first detent member disposed in the first detent bore and having a projecting portion configured to match the first detent recess; and

first means disposed in the first detent bore for urging the projecting portion of the said first detent member radially toward the first detent recess; and

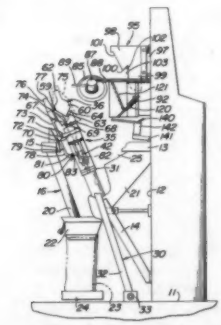
wherein the distal end of the locking pin is spaced from at least the first member in the extended position of the guide shaft and is snapped into abutment with the first member through the locking aperture in the second member upon disengagement of the detent means by rotation of the shaft.

4,407,046

POULTRY CUTTING APPARATUS

Stanley Wright, Cherry Hill, N.J., assignor to Precision Automation Co., Inc., Cherry Hill, N.J.

Filed Nov. 16, 1981, Ser. No. 321,438
Int. Cl.³ A22C *21/00*
U.S. Cl. 17—11 **9 Claims**



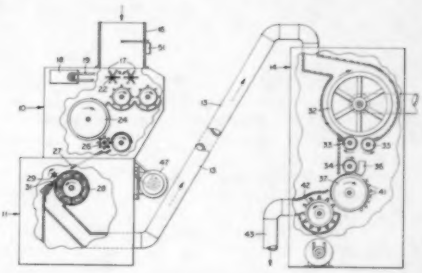
1. A poultry cutting apparatus comprising a poultry mandrel mounted for shifting movement along a path forwardly and rearwardly into and out of a forward carcass loading position, said mandrel having at least one slot facing laterally of said path, a clamp mounted for movement rearwardly and forwardly into and out of clamping relation with said mandrel and movable with said mandrel in clamping relation therewith for holding a carcass on the mandrel, forward cutting means at a forward region of said path for cutting of a carcass upon rearward mandrel movement, rearward cutting means at a rearward region of said path for movement into said one slot and cutting of said carcass, said carcass being released upon forward clamp movement away from and out of clamping relation with said mandrel, said one slot opening through said mandrel transversely of said path, said rearward cutting means comprising a pair of shear action blades mounted for extension into and retraction from said one mandrel slot and combining upon shearing action to pass entirely through said one mandrel slot, and die cutting portions on said shear action blades for die cutting coaction with said mandrel.

4,407,047

COTTON GINNING SYSTEM EMBODYING A LINT CLEANER AND PROCESS OF OPERATING THE SAME

Donald W. Van Doorn; Tommy W. Webb, and James B. Hawkins, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Nov. 19, 1980, Ser. No. 208,159
Int. Cl.³ D01B *1/06*; D01H *5/32*
U.S. Cl. 19—64.5 **7 Claims**



1. In a process of operating a cotton ginning system which includes a seed cotton feeder having driven feed means for delivering seed cotton to a gin and a lint cotton cleaner having a driven feed works for delivering the lint received from the gin to a driven worker such as a saw, the steps of:

(a) continuously sensing the rate of motion of the feeder feed means and from said sensing thereof obtaining signals representative of the amount of seed cotton being delivered by the feeder to the gin, and

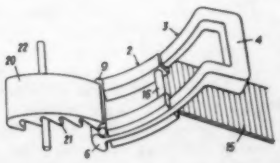
(b) utilizing said signals while the system is in operation to vary the rate of motion of the lint cleaner feed works to deliver predetermined desired batt thickness of lint cotton from the lint cleaner feed works to the saw.

4,407,048

BUCKLE FOR FASTENING TOGETHER THE PARTS OF A SHOE

Erwin Bucheder, Köflach, Austria, assignor to Koflach Sportgeräte Gesellschaft m.b.H., Koflach, Austria

Filed May 28, 1981, Ser. No. 268,114
Claims priority, application Austria, Jun. 27, 1980, A 3390/80
Int. Cl.³ A43C *11/00*
U.S. Cl. 24—69 SK **11 Claims**



1. A buckle for fastening together the parts of a shoe, partic-

ularly of a skiing boot or mountaineering boot, comprising an elongated tensile element, a tightening lever pivoted on a hinge pin that is transverse to the longitudinal axis of the tensile element, which is adapted to be secured to the surface of the shoe, and an abutment adapted to be connected to the shoe and cooperating with the tightening lever, said lever and abutment being on different parts of the shoe and being engageable to draw the shoe parts toward each other when said lever is swung to a closed position, characterized in that the tightening lever comprises first and second parts, which are longitudinally displaceable relative to each other and are guided relative to each other, that the tensile element is adapted to be secured to said first part of the lever, and that the second part of the tightening lever constitutes a handle which, after the lever has been swung to the closed position, can be displaced relative to said first part toward the tensile element longitudinally beyond the hinge pin of the tightening lever.

4,407,049

BUCKLE FOR BELTS OR THE LIKE

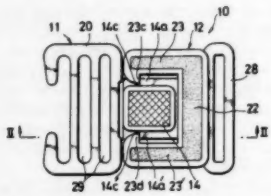
Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo, K.K., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,642

Claims priority, application Japan, Jul. 18, 1980, 55-101539[U]

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—230 AS **7 Claims**



1. A buckle for fastening together loose ends of a belt or the like, the buckle comprising: a male part and a female part, said parts each having a belt-end retainer connected to one of the ends of the belt, said male part comprising a plug member and said female part comprising a receptacle member releasably engageable with said plug member; said plug member having opposite flat side portions and a raised head portion defining therebetween a generally U-shaped groove to permit said raised head portion to flex resiliently, said head portion including a pair of sloped shoulders which are inclined progressively upwardly and a button portion lying in a plane parallel to said flat side portions; said receptacle member having a transverse closed rear-end flange portion, two oppositely disposed side flange portions having their respective one ends integrally connected to opposite ends of the rear-end flange portion and having their respective other ends free, and a guide channel formed coextensively with said flange portions, said side flange portions having at their respective free ends a pair of inwardly projecting lugs which project inwardly towards one another and which are spaced apart by a gap at the front end of said receptacle member, said lugs being configured to releasably engage with said shoulders of said head portion upon insertion of said plug member into said receptacle member to thereby releasably couple together said male and female parts.

4,407,050

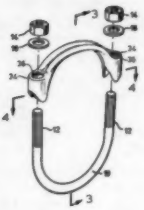
CLAMPS

Hermann F. Offterdinger, 1109-5170 Lakeshore Rd. East, Burlington, Ontario, Canada L7L 1C4

Continuation-in-part of Ser. No. 215,608, Dec. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,659, Jun. 11, 1979, abandoned. This application Feb. 11, 1982, Ser. No. 347,811

Int. Cl.³ F16L *33/10*; **B65D** *63/00*

U.S. Cl. 24—277 **20 Claims**



8. A clamp saddle member for a clamp of the type which encircles a clamp-receiving member on which it is clamped, the clamp comprising:

a clamp bolt member, and

a clamp saddle member formed from a piece of sheet metal, the bolt member and the saddle member cooperating with one another to encircle the clamp-receiving member,

the bolt member including means for tightening the clamp about the clamp-receiving member,

the clamp saddle member having a bight portion of arcuate shape so as to have a concave side for engagement with the clamp-receiving member and an opposite convex side,

the saddle member having two integral spaced bolt-receiving portions at the respective ends of the arcuate bight portion which receive the bolt member and the tightening means for the application of clamping force to the clamp by the said tightening means,

wherein the said arcuate saddle bight portion consists of a portion of the sheet metal piece that has been bent to closed tubular form with the radially outer wall portion thereof collapsed toward the radially inner wall portion, so that the bight thereby consists of two immediately adjacent thicknesses of the metal sheet and is of open-sided channel transverse cross-section with the channel opening at the radially outer convex side.

4,407,051

SLIP-IN DRAPERY HOOK

Richard B. Ryan, Libertyville, Ill., assignor to Richard Ryan & Associates, Inc., Northbrook, Ill.

Continuation-in-part of Ser. No. 172,835, Jul. 28, 1980, Pat. No. 4,344,210, which is a continuation-in-part of Ser. No. 73,668, Sep. 10, 1979, Pat. No. 4,261,080. This application Jun. 18, 1982, Ser. No. 389,666

Int. Cl.³ A44B *13/00*

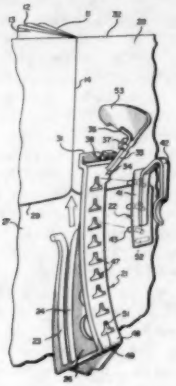
U.S. Cl. 24—369 **8 Claims**

1. A drapery support for a drapery having a preformed pleat comprising:

a vertical elongated base, having an upper and a lower end;

attaching means adjacent the lower end of said base for attaching said base to the rear surface of said drapery at a location opposite said pleat, with the upper end of said base adjacent the upper edge of said drapery;

clamp means associated with the upper end of said base for engaging the upper edge of said drapery; and



a hook assembly for engaging a traverse rod or the like, said assembly being adapted to be removably secured to said base at a selected location along its length.

4,407,052

STUFFING ATTACHMENT FOR A CONTINUOUSLY OPERATING CRINKLING UNIT

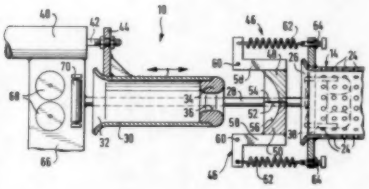
Klaus G. Kühn, Winterweg 52, 8751 Obernau, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,252

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1979, 2926478

Int. Cl.³ D06C *23/04*; D06J *1/02*

U.S. Cl. 26—2 R **8 Claims**



1. A stuffing attachment for a continuously operating crinkling unit having a compression tube with an axis which runs in a straight line in its starting zone and receptive of continuous strip-form material, the attachment comprising: a stuffing ring; means mounting the stuffing ring for displacement in the direction of the straight-line axis of the compression tube between an inner dead point, at which the stuffing ring is located inside the compression tube and an outer dead point, at which the stuffing ring is located outside the compression tube; the side of the stuffing ring facing the compression tube being torus-shaped and said stuffing ring having an aperture in a plane normal to its direction of travel, through which the strip-form material passes; clamping means located upstream of the compression tube and having a variable size passage opening, which can be opened so wide that the stuffing ring can pass completely through to stuff the material into the compression tube, and which can be shut to such an extent that it grips the strip to prevent it from being pulled back by the movement of the stuffing ring, said clamping means comprising at least two movable clamping jaws of which the mutually opposed clamping surfaces limit the passage opening, the sides of the clamping jaws which face away from the compression tube forming a concave surface; and means mounting said clamping jaws for pivotable movement about a bearing point fixed relative to the attachment, said means mounting said clamping jaws including means pressing the clamping jaws in a resilient manner having at least one spring.

4,407,053

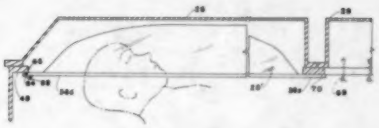
COVER FOR CASKETS

Alease E. Ball, 6715 Parsons Ave., Baltimore, Md. 21215

Filed Nov. 24, 1981, Ser. No. 324,536

Int. Cl.³ A61G *17/00*

U.S. Cl. 27—14 **1 Claim**



1. In combination, an elongate casket having a bottom and first and second sides and first and second ends, forming an opening, first and second tops hinged to the first side for longitudinally abutting over the opening and enclosing a body within the casket; means for detachably securing the second top shut, leaving a viewing opening; said first and second sides and first end and second top forming fixed overhangs around said viewing opening; means for closing the viewing opening for restricting contagion and odors and access to a body in the casket while preserving a selected degree of visual access to said body; means for locking said means for closing the viewing opening, said means for closing the viewing opening comprising a cover having out wardly convex shape and proportioned for permitting said first top to close over the cover, said cover being of transparent material, said cover having margins therearound and having proportion for installation in said viewing opening beneath said second top with said margins therearound beneath respective of said fixed overhangs, the means for locking including a plurality of hooks on said margins, said plurality of hooks engageable from a position beneath the cover at said first side and said first end, the means for locking including a padlock, and said margins having clipped-corner shapes adjacent said second top.

4,407,054

METHOD OF MAKING ELECTROMECHANICAL TRANSDUCERS USING IMPROVED FLEXIBLE COMPOSITE PIEZOELECTRIC MATERIAL

George G. Zipfel, Jr., Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1980, Ser. No. 201,473

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **12 Claims**

1. A method of making a flexible composite piezoelectric material by steps comprising polarizing particles of a piezoelectric material that are dispersed in a prepolymer material by applying an electric field to said prepolymer material, while simultaneously inducing a dipole moment in said particles, wherein said prepolymer material at least partially polymerizes during said polarizing,

CHARCTERIZED IN THAT the shear modulus of the at least partially polymerized material after said polarizing is (less than 20 pounds per square inch) sufficiently small that the hydrostatic piezoelectric response of said composite is substantially stable over time, and wherein said electric field is in the range of 100 to 1,000 kilovolts per meter, and the ratio of the major-to-minor axes of said piezoelectric particles is less than 2 to 1, and wherein said

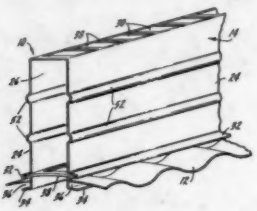
piezoelectric material is selected from the group consisting of lithium sulfate monohydrate and tartaric acid.

4,407,055

METHOD OF MAKING SURFACE DRAINAGE CULVERT

Shelton R. Rossberg, Houston, Tex., assignor to Ramco Steel, Inc., Houston, Tex.

Division of Ser. No. 284,065, Jul. 16, 1981, Pat. No. 4,365,911, which is a continuation-in-part of Ser. No. 168,309, Jul. 10, 1980, abandoned. This application Aug. 27, 1982, Ser. No. 412,104
Int. Cl.³ B21D *53/00*; B21K *29/00*; B23D *15/26*
U.S. Cl. 29—157 R 8 Claims



1. A method of fabricating a surface drainage culvert of the type having a pipe section which is cut longitudinally forming an aperture along its upper surface and having an upstanding, longitudinal grate assembly received within the aperture, the method comprising the steps of:

a. forming the aperture by cutting a series of longitudinally spaced slots in the pipe with unslotted pipe portions separating each said slot,

b. fabricating a grate assembly comprising an apertured end face, an open end, and a pair of spaced parallel sidewalls forming between the sidewalls a longitudinal inlet drainage passage, said sidewalls further having a longitudinal guide formed adjacent the open end of the grate assembly, said guide comprising a channel in each sidewall, said channels facing one another and extending outwardly from said drainage passage,

c. inserting the grate assembly within the aperture with the longitudinal guide channel walls contiguous to the outer surface of the pipe, and

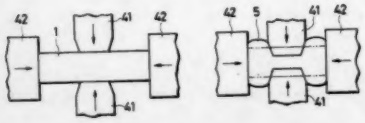
d. inserting spacer means in said guide channels to maintain the spacing of said sidewalls at said aperture and to lock the grate assembly within said aperture.

4,407,056

METHOD AND APPARATUS FOR MANUFACTURING METAL SECTIONS

Kazuo Watanabe; Hideki Tokita, both of Kitakyushu, and Koe Nakajima, Nakama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 81,814, Oct. 4, 1979, abandoned. This application Dec. 30, 1981, Ser. No. 335,669
Claims priority, application Japan, Apr. 7, 1978, 53-40280
Int. Cl.³ B21B *15/00*
U.S. Cl. 29—527.7 12 Claims



1. A method of manufacturing metal sections, comprising:

hot-forging a substantially quadrangular cross-section starting material in the longitudinal direction thereof into a blank having a concave portion therein in the middle of the long sides of the cross-section and upstanding flange portions at the ends of the long sides of the cross-section by applying, while moving the starting material in the direction of the length, forging pressure to the opposite surfaces defining the long sides of the cross-section and along a length of the starting material, which forging pressure is applied substantially perpendicular to the longitudinal axis of the starting material and being uniform from one end of the length to near the other end, and then gradually decreasing to said other end, while at the same time applying further forging pressure to the opposite surfaces of the starting material defining the end surfaces of the cross-section and in a direction substantially perpendicular to the longitudinal axis of the starting material, said further pressure being sufficient for at least preventing material of the starting material from flowing toward the ends of the cross-section of the starting material, repeating the application of forging pressures on the succeeding lengths of the starting material and applying the uniform forging pressure to the portion of the preceeding length to which the gradually decreasing forging pressure has been applied for forming a substantially uniform cross-section throughout the entire length of the blank; and

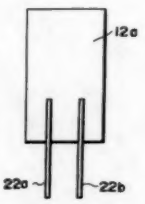
hot rolling the blank into a generally H-shaped metal section having the desired cross-section.

4,407,057

METHOD OF PRODUCING A FLAT THIN FILM TYPE OXYGEN SENSOR

Shinji Kimura, Yokohama; Hiroshi Takao, Kamakura; Satoshi Ambe, Yokosuka, and Yoshio Akimune, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 162,001, Jun. 23, 1980, Pat. No. 4,347,114. This application Apr. 16, 1982, Ser. No. 369,079
Claims priority, application Japan, Jun. 26, 1979, 54-79736
Int. Cl.³ G01N *27/58*; H01G *9/04, 9/24*
U.S. Cl. 29—570 6 Claims



1. A method of producing a solid oxygen sensor, comprising the steps of:

(a) applying a material of a first electronically conductive electrode layer in a paste condition onto a surface of an unfired partition layer leaving a plurality of independent portions of said surface uncovered with the paste;

(b) applying a material of an oxygen ion conductive electrolyte in a paste condition onto the outer side of the layer of the first electronically conductive electrode material on said partition layer;

(c) applying a material of a second electronically conductive electrode layer in a paste condition onto the outer side of the layer of the oxygen ion conductive electrolyte material leaving a plurality of independent portions of the outer side of the layer of electrolyte material uncovered with the material of the second electrode layer, the material of said second electrode layer being the same as that of said first electrode layer;

(d) applying a material of a porous protective layer in a paste condition onto the outer side of the layer of the second

electrode material to provide an unfired multi-layered article; and

(e) firing said article to form a solid article.

4,407,058

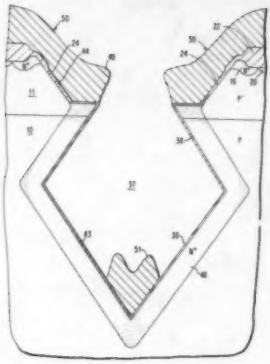
METHOD OF MAKING DENSE VERTICAL FET'S

Joseph J. Fatula, Jr., Poughkeepsie, N.Y.; Paul L. Garbarino, Ridgefield, Conn., and Joseph F. Shepard, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1981, Ser. No. 266,231

Int. Cl.³ H01L *21/225*

U.S. Cl. 29—571 **9 Claims**



1. A method of forming a dense vertical FET device including:

providing a dielectrically isolated region in a substrate of monocrystalline silicon;

forming a first region of opposite conductivity to the conductivity of the substrate in a surface of the dielectrically isolated region to function as one of drain and source regions of the FET;

anisotropically chemical etching through the first region of opposite conductivity and into the substrate to a selected depth to produce a first recess surrounded at its upper end by the first region of opposite conductivity and having converging walls and a substantially flat bottom wall with the length of each of the converging walls in the substrate beneath the first region of opposite conductivity being the desired length of a gate channel of the FET;

forming a first layer of silicon dioxide over the converging walls and the bottom wall of the first recess in the substrate;

forming a second layer of a material selected from the group consisting of silicon nitride and polycrystalline silicon over the layer of silicon dioxide;

forming a third layer of silicon dioxide over the second layer of material;

removing each of the first layer, the second layer, and the third layer from at least a portion of the bottom wall of the first recess to expose at least the portion of the bottom wall of the first recess while leaving each of the first layer, the second layer, and the third layer on at least the converging walls of the first recess;

etching an enlarged recess in the substrate through the exposed portion of the bottom wall of the first recess not protected by the first layer, the second layer, and the third layer;

diffusing an impurity of opposite conductivity to the conductivity of the substrate into the walls of the enlarged recess to form a second region of opposite conductivity to the conductivity of the substrate to function as the other of the source and drain regions of the FET and a plate of a storage capacitor;

removing each of the first layer, the second layer, and the third layer from the converging walls of the first recess after the second region of opposite conductivity is formed only when the second layer is silicon nitride;

providing a gate oxide for the gate channel of a layer of silicon dioxide by forming a layer of silicon dioxide over the converging walls of the first recess after removal of the first layer, the second layer, and the third layer when the second layer is silicon nitride and by using the first layer of silicon dioxide when the second layer is polycrystalline silicon;

and forming electrical contacts to each of the first region of opposite conductivity and the gate channel.

4,407,059

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

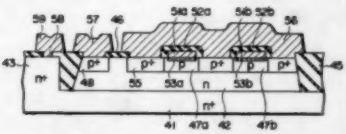
Yoshitaka Sasaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 20, 1981, Ser. No. 294,749

Claims priority, application Japan, Aug. 25, 1980, 55-116562

Int. Cl.³ H01L *21/225*

U.S. Cl. 29—571 **13 Claims**



1. A method of producing a semiconductor device, comprising the steps of:

forming an oxidation-resistive insulating film having one or more openings on a semiconductor substrate of a first conductivity type;

forming an impurity-doped polysilicon pattern in at least the opening of the insulating film by etching using a mask substantially equal in size to the opening;

forming a silicon oxide film on the exposed surface of the polysilicon pattern by thermal oxidation;

removing the oxidation insulating film; and

depositing a conductive material and, then, patterning said conductive material layer for forming an interconnection electrode layer insulated from the polysilicon pattern by the silicon oxide film.

4,407,060

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

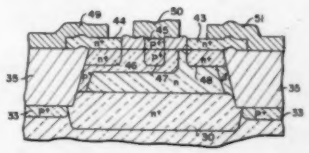
Junji Sakurai, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 13, 1981, Ser. No. 263,281

Claims priority, application Japan, May 14, 1980, 55/63571

Int. Cl.³ H01L *21/265, 21/268*

U.S. Cl. 29—576 E **8 Claims**



1. A method of manufacturing a semiconductor device having a semiconductor substrate, comprising the steps of:

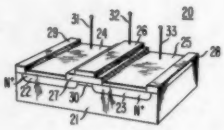
(a) forming an insulating layer having a window on the semiconductor substrate, the window extending through the insulating layer to the semiconductor substrate;

(b) forming a semiconductor layer containing an impurity on the insulating layer and in the window;
(c) melting the semiconductor layer underlying the window and the semiconductor substrate adjacent to the semiconductor layer underlying the window by irradiating the semiconductor layer with a high energy beam such that said impurity is diffused into a portion of the semiconductor substrate; and
(d) selectively etching the semiconductor layer to form a contact electrode contacting the portion of the substrate diffused with said impurity.

4,407,061
FABRICATION PROCEDURE USING ARSENATE GLASSES

William H. Grodkiewicz, New Providence; Shobha Singh, Summit, and LeGrand G. Van Uitert, Morristown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 4, 1981, Ser. No. 270,504
Int. Cl.³ C03C *3/12, 3/26;* B05D *1/34*
U.S. Cl. 29—576 B **45 Claims**

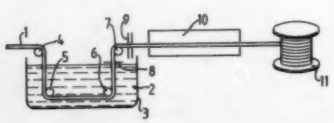


1. A process for fabricating a device comprising the step of covering at least part of at least one surface with a layer of glass by particle bombardment of a glass target characterized in that the layer of glass consists essentially of 10 to 50 mole percent pentavalent arsenic oxide remainder an oxide substance consisting essentially of at least one metal oxide selected from the group consisting of the oxides of indium, thallium, gallium, boron, zinc, cadmium, copper, germanium, phosphorus, tellurium, lead, bismuth, sodium, potassium, rubidium, cesium, and tellurium and the glass target is made by heating a mixture consisting essentially of a source of pentavalent arsenic and a source of oxide substance to a temperature between 1225 and 1350 degrees C. for at least five minutes in which the source of pentavalent arsenic is arsenic acid.

4,407,062
METHODS OF PRODUCING SUPERCONDUCTORS

Gordon R. Sutcliffe, Millbank; Stephen J. Warden, Erdington, and Donald Humpherson, Great Barr, all of England, assignors to Imi Kynoch Limited, Birmingham, United Kingdom

Filed Jun. 24, 1981, Ser. No. 276,994
Claims priority, application United Kingdom, Jul. 15, 1980, 8023113; Feb. 18, 1981, 8105136
Int. Cl.³ B05D *5/12*
U.S. Cl. 29—599 **8 Claims**

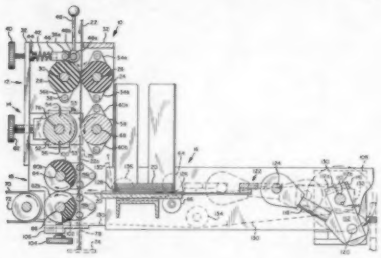


1. A method of insulating an intermetallic compound superconducting wire product which comprises the steps of coating an intermetallic superconductor wire precursor with a coating from an aqueous mixture consisting essentially of sodium silicate, China clay and calcium carbonate, drying the coated wire precursor after coating and winding the dried wire precursor around a former, heating the wire and former to form an insulating ceramic from the coating and reacting the components of the intermetallic compound in the precursor to form the intermetallic superconducting compound in the wire.

4,407,063
METHOD AND APPARATUS FOR FABRICATING BATTERY PLATE ENVELOPES

Peter E. Johnson, 500 Crescent Valley Dr., Corvallis, Oreg. 97330

Continuation-in-part of Ser. No. 250,892, Apr. 3, 1981, abandoned. This application Oct. 13, 1981, Ser. No. 311,002
Int. Cl.³ H01M *2/14*
U.S. Cl. 29—623.2 **20 Claims**



1. A method for fabricating battery plate envelopes from a sheet formed of microporous plastic material having a width greater than that of the battery plate to be enveloped, comprising:
pushing a battery plate edgewise into the sheet to fold the sheet about the battery plate with edges overlapping the battery plate on both sides;
feeding the folded sheet with the battery plate therein into the interface between a pair of opposed pressure rollers, each of which includes a pair of axially aligned sealing wheels; and
continuously sealing the overlapping edges of the sheet by compressing the edges into one another between the sealing wheels, the compressive force being applied uniformly along the entire extent of said overlapping edges and being within the range of the plastic flow of the material.

9. An apparatus for fabricating battery plate envelopes from a folded sheet of microporous plastic material having facing folds and having a width which is greater than that of the battery plate to be enveloped, said apparatus comprising:
a pair of opposing rotatably mounted pressure rollers having parallel axes, each of said rollers including two sealing wheels which are axially spaced on each of said rollers by a distance greater than the width of the battery plate but less than the width of the folded sheet, each of said sealing wheels being radially aligned with one of the sealing wheels mounted on the other of said pressure rollers, said aligned rollers being arranged such that the clearance therebetween remains constant throughout the entire rotational travel of said rollers thereby defining a constant sealing wheel interface, said sealing wheels being adapted to receive the side edges of the folded sheet at their interface; and
means for rotating said rollers so that the edges of the sheet are compressed into each other by said sealing wheels, thereby continuously sealing the edges to form an envelope.

4,407,064

APPARATUS FOR PULLING TRANSVERSE FINS ONTO A PLURALITY OF PIPES

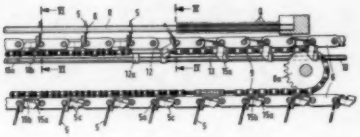
Peter Denner; Egon Ernst, both of Ratingen, and Alfred Jockel, Essen, all of Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,311

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921415

Int. Cl.³ B23P *15/26*

U.S. Cl. 29—726 13 Claims



1. An apparatus for pulling transverse fin plates onto a plurality of pipes which are arranged fixed in position alongside of each other by carriers which are operatively swingably supported at two ends thereof to respective endless carrier conveyor chains between a working position engaging the fin plates and a release position which releases the fin plates, the carriers being provided with at least one support foot which holds the carriers in the working position, the at least one support foot being supported on support members of a control device which holds the carriers in the working position along a transport path where the fin plates are pulled on the pipes until the release of the transverse fin plates, and the control device releases the carriers for swinging at a point of release as a function of the spacing between the fin plates and the thickness of the transverse fin plates and which have already been pulled on the pipes, the point of release moving opposite to the direction of motion of the carrier conveyor chains, the improvement wherein

the transport path is subdivided into a transport region and a control region, respectively, by different respective support formations on said support members, said different respective support formations constitute support means for the holding of the carriers in the working position via the at least one support foot in the transport region and in the control region, respectively,

the control device includes a first of the support members comprising a control slide with one of said different respective support formations defining said control region and disposed exclusively at an end of the transport path, and a plurality of second of the support members disposed in said transport region, said first and second support members include said different respective support formations,

the at least one support foot includes at least one support foot means for supporting said carriers, respectively, via said one of said different respective support formations on said control slide, the latter constituting means for precisely releasing said at least one support foot means and said carriers, respectively, and

other of said different respective support formations of said second support members comprise said support means for providing a different support of said at least one support foot means with more play and less friction per unit path than that of said one of said different respective support formations of said control slide.

4,407,065

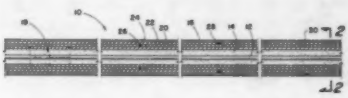
MULTIPLE SHEATH CABLE AND METHOD OF MANUFACTURE

Stanley J. Gray, 8502 E. 121st St., Bixby, Okla. 74008

Division of Ser. No. 112,933, Jan. 17, 1980, Pat. No. 4,317,003. This application Sep. 4, 1981, Ser. No. 299,473

Int. Cl.³ H01B *13/20*

U.S. Cl. 29—828 9 Claims



1. A method of manufacturing multiple sheath cable in long lengths comprising the steps of:

(a) applying a first continuous metal sheath to an insulated conductor of the desired length;

(b) splicing the first continuous metal sheath at locations radially and longitudinally spaced from any conductor splice joints;

(c) reducing the diameter of the first metal sheath to tightly grip the insulated conductor; and

(d) applying second and subsequent metal sheaths to the first sheath repeating steps (a), (b) and (c).

4,407,066

APPARATUS AND METHOD FOR FORMING AN ELECTRICAL SWITCH ASSEMBLY OR THE LIKE

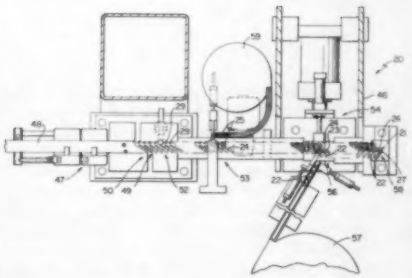
James C. Gunter, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 64,724, Aug. 8, 1979, Pat. No. 4,312,122. This application May 29, 1981, Ser. No. 268,346

The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.³ H01R *43/04;* B23P *23/00*

U.S. Cl. 29—882 30 Claims



1. In a method for forming electrical switch assemblies each of which comprises a terminal member and a switch blade secured together at a station in an apparatus, the improvement comprising the steps of feeding an elongated strip of switch blade material to said station with a first feeding means of said apparatus, forming said strip of switch blade material into a plurality of switch blades serially interconnected together upstream from said station, serially feeding terminal members to said station with a second feeding means, serially securing a terminal member and a switch blade together at said station with a securing means, and serially separating each switch assembly from said strip of material downstream from said station with separating means.

16. In an apparatus for forming electrical switch assemblies each of which comprises a terminal member and a switch blade secured together at a station in said apparatus, said apparatus

having a frame means, the improvement wherein said apparatus has first feeding means carried by said frame means for feeding an elongated strip of switch blade material to said station, said apparatus having forming means carried by said frame means for forming said strip of switch blade material into a plurality of switch blades serially interconnected together upstream from said station, said apparatus having second feeding means carried by said frame means for serially feeding terminal members to said station, said apparatus having securing means carried by said frame means for serially securing a terminal member and a switch blade together at said station, said apparatus having separating means carried by said frame means for serially separating each switch assembly from said strip of material downstream from said station.

4,407,067

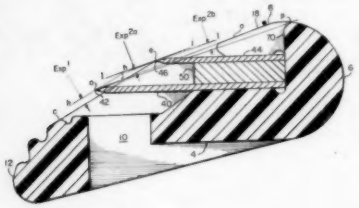
SHAVING IMPLEMENT

Robert A. Trotta, Winthrop, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 194,551, Oct. 6, 1980, Pat. No. 4,354,312. This application Sep. 3, 1981, Ser. No. 298,728

Int. Cl.³ B26B *21/22*

U.S. Cl. 30—50 **6 Claims**



1. A shaving implement comprising a platform member, a cap member, and blade means disposed therebetween, said platform member comprising a blade support portion, a guard portion mounted forwardly of said blade support portion, and a back portion upstanding from said blade support portion, said guard and back portions defining parallel opposite lengthwise edges of said platform member, said cap member comprising a series of fingers extending from said back portion forwardly toward said guard portion, said fingers being separated from each other by recesses therebetween, said fingers including a first skin-engaging point and said recesses being defined in part by a cap member wall comprising a second skin-engaging point, and said blade means comprising a first blade member having a first cutting edge disposed rearwardly of said guard portion, a second blade member having a second cutting edge disposed rearwardly of said first cutting edge, and spacer means for maintaining said first and second blade members in spaced parallel relationship, said first and second cutting edges each having a blade tangent angle in the range of 20°–32° and a span in the range of 0.030 to 0.080 inch, said first blade member having an exposure of 0.0015±0.0015 inch, and said second blade member having alternating first and second exposures along its length, said first exposure being determined by a first tangent line extending from said first cutting edge to said first skin-engaging point, and said second exposure being determined by a second tangent line extending from said first cutting edge to said second skin-engaging point.

4,407,068

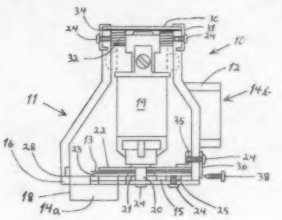
HAIR CUTTER WITH VACUUM

Timothy W. Wilson, 2303 5th Ave. South, Apt. 2, Minneapolis, Minn. 55404

Filed Mar. 15, 1982, Ser. No. 357,847

Int. Cl.³ B26B *19/44*

U.S. Cl. 30—133 **3 Claims**



1. Hair cutting apparatus comprising,

a. a main body case,

b. an electric motor mounted in said case, and having a rotary shaft with an axis of rotation,

c. said case having a nozzle opening therein and located in radially offset relation to the axis of rotation of the motor shaft,

d. a nozzle mounted in said case surrounding said opening and having its lower end constructed to permit engaging the surface of a person's head to ride thereon,

e. a cutter blade connected to the motor shaft and mounted to rotate in a path across the upper end of said nozzle to cut off hair extending through said nozzle, the length of the hair cut being determined by the distance between the lower end of the nozzle and the cutter blade path,

f. means for adjusting the distance between the lower end of the nozzle and the path of the cutter blade,

g. a vacuum opening in said case above the nozzle and located on the opposite side from the nozzle opening communicating with said nozzle opening to draw hair through the nozzle into the path of the cutter blade, and cause the hair to stand up in the path of the cutter blade and also draw off the cut hair, and

h. a pair of support plates disposed on opposite sides of said cutter blade, said plates being provided with aligned, notched-out segments located in diametrically opposed relation to the vacuum opening and in registration with each other and with the nozzle opening to surround the major portion of the cutter blade path and expose only the outer end portion of the cutter blade to the hair as it enters said opening through the nozzle, thus providing substantially uniform maximum cutter speed for cutting all of the hair.

4,407,069

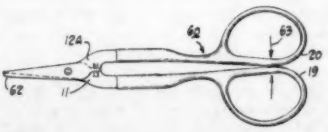
SCISSORS WITH CUSHIONED STOP

John A. Conners, Fairfield, Conn., assignor to The Scott & Fetzer Company, Shelton, Conn.

Filed Dec. 8, 1981, Ser. No. 328,651

Int. Cl.³ B26B *13/20*

U.S. Cl. 30—254 **13 Claims**



1. Scissors comprising, in combination:

first and second blades made from flat stock of substantially uniform thickness and each having a cutting edge and an inner side surface;

pivot means acting between said blades and establishing a pivot axis for the blades for cutting cooperation of said cutting edges by sliding past one another substantially parallel to said inner side surfaces;

a handle on the end of each blade opposite the respective cutting edge;

stop means establishing the closed position of the scissors;

said stop means including a first stop surface unitary with said first blade;

a second stop surface unitary with said second blade and abuttable with said first stop surface to limit the closed position of said blades;

a third stop surface unitary with said second blade;

a fourth stop surface unitary with said first blade and abuttable with said third stop surface to limit the closed position of said blades at substantially the same time as abutment between said first and second stop surfaces;

each of said stop surfaces and said entire stop means lying within the thickness of said two blades;

said stop means including at least two shear cuts in said first blade establishing said first stop surface, and a bend in the material of said first blade between said two shear cuts to establish the blade material therebetween bent out of the thickness of said first blade and with said first stop surface at least partially out of the thickness of said first blade;

resilient means including at least one of said handles or said stop means being resilient;

said first and second stop surfaces and said third and fourth stop surfaces being located close to said pivot axis relative to the length of said handles to establish substantially face-to-face abutment therebetween with the cutting edges closed yet the handles still slightly spaced apart and with each cutting edge protected by said inner side surface of the other blade; and

the blades presenting minimal opposition to movement of said handles until said stop surfaces engage and then the subsequent stressing of said resilient means establishing a cushioned stop of movement of said handles.

4,407,070

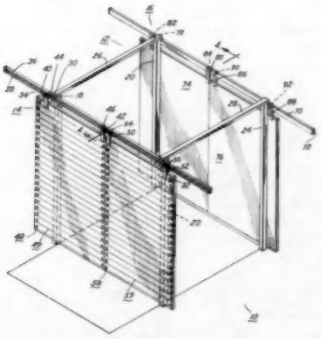
ANIMAL MEASURING APPARATUS

Henry E. Lowe, 21725 Allegheny St., Cassopolis, Mich. 49031

Filed Jun. 12, 1981, Ser. No. 273,204

Int. Cl.³ G01B *5/02*

U.S. Cl. 33—169 R **9 Claims**



1. An animal measuring apparatus comprising a first vertically disposed panel having two vertical sections horizontally moveable relative toward and away from one another, a second vertically disposed panel having two vertical sections horizontally moveable relative to one another and being positioned parallel with and spaced from said first panel, and a measuring scale disposed on at least one of said panels for determining the size and/or physical stature of an animal positioned in front of said last mentioned panel.

4,407,071

INTERNAL DIAMETER MEASURING DEVICE FOR PIPES

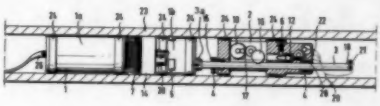
Dieter Boeder, Duesseldorf, and Karl-Josef Wiemers, Bochum, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 29, 1981, Ser. No. 230,050

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003415

Int. Cl.³ G01B *5/12, 7/12*

U.S. Cl. 33—178 E **3 Claims**



1. An improved internal diameter measuring arrangement for pipes, gun barrels and the like, wherein the arrangement is slidably axially movable through the bore of the pipe, gun barrel or the like, the improvement comprising in combination the following features:

(a) a measuring sled axially slidably movable along the bore walls of the to be measured pipe;

(b) said measuring sled includes first clamping jaw means and is adapted to be fixedly mounted in said pipe by means of said first clamping jaw means;

(c) said measuring sled further including a portion operatively coaxially connected thereto which is rotatable relative to the measuring sled;

(d) in that portion of said measuring sled which is nonrotatably mounted in said pipe there is operatively mounted means for rotating said rotatable portion of said measuring sled about the pipe axis;

(e) said rotatable portion of said measuring sled having a plurality of feeler fingers operatively mounted thereon which extend past the outer periphery of said rotatable portion of said measuring sled and which are biased against the bore walls of the pipe; said feeler fingers being operatively connected to electrical pulse emitting means which are adapted to emit electrical pulses representative of the measurements carried out by the feeler fingers and transmit such pulses to an evaluation unit;

(f) the measuring sled is connected via a toothed rack to a support which is fixable within said pipe and is adapted to be axially moved therethrough, said fixable support includes adapting ring means coaxially mounted thereon for slidably supporting said support within the pipe;

(g) the support further includes second clamping jaw means operatively mounted thereon and adapted to be biased outwardly for fixing said support in a predetermined position in the pipe; and

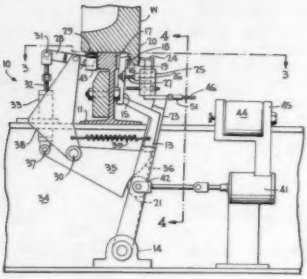
(h) the support includes a step motor which is operatively connected via gear means to said toothed rack in such a way that when said first clamping jaws of said measuring sled are biased against the bore walls and said second clamping jaw means of said support are not biased thereagainst the support is adapted to be axially reciprocally moved through said pipe, whereas when said first clamping jaws of said measuring sled are not biased against the bore walls of the pipe and said second clamping jaws of the support are biased thereagainst, the measuring sled is adapted to be axially reciprocally moved through said pipe.

4,407,072

THIN FLANGE AND LOOSE WHEEL DETECTION SYSTEM

Paul T. Hoskins, Jr., Spencer, N.C., assignor to Southern Railway Company, Washington, D.C.

Filed Nov. 13, 1981, Ser. No. 321,129
Int. Cl.³ B61K 9/12; B61L 11/02
U.S. Cl. 33—203.11 **10 Claims**



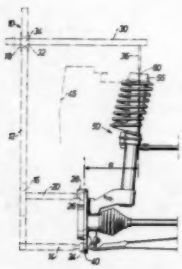
1. A system for detecting the thickness of a flange of a railroad wheel which is reduced from a predetermined thickness, comprising a pair of relatively movable contact means for respectively bearing against the inner face of the flange and the back face of the rim of the railroad wheel, means for operating said contact means to effect said relative movement thereof upon a passing by of said wheel, switch means actuated upon relative movement of said contact means toward one another to a spacing which is less than said predetermined thickness, and means connected to said switch means for signalling a reduced flange thickness condition upon said relative movement.

4,407,073

MEASURING APPARATUS FOR CHECKING A SPRING STRUT APPERTAINING TO THE FRONT WHEEL SUSPENSION OF A VEHICLE

Lars-Erik Nilsson, and Tommy Löfling, both of Hedemora, Sweden, assignors to Aktiebolaget Samefa, Kungsoer, Sweden

Filed Jul. 8, 1981, Ser. No. 281,276
Int. Cl.³ G01B 5/14
U.S. Cl. 33—203.18 **8 Claims**



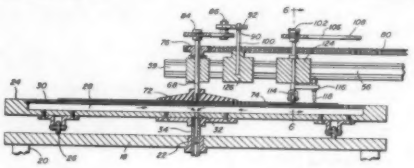
1. Measuring apparatus for checking a so-called spring strut of the type which is used in the front wheel suspension of a vehicle equipped with disc brakes incorporating a brake disc exposable by removal of a corresponding vehicle wheel and tyre, the measuring apparatus being designed to detect any displacement relative to the wheel of an upper fixing of the associated spring strut in the vehicle bodywork which may arise, and which is an indication of possible deformation of the strut and means a serious fault in the setting of the wheel and thus also in the steering geometry of the vehicle, the measuring apparatus comprising an upright, a base part which is attached to and projects out from the upright, the base part being equipped with fixing means removably fixable on the outer face of the exposed brake disc for supporting the upright on the brake disc and substantially parallel to the plane of the brake disc, a measuring arm which is adjustably mounted on the upright and which extends out from the upright in a direction perpendicular to said plane of the brake disc, said measuring arm carrying an indicator or pointer arrangement, the arrangement being such that the centre of the said upper fixing of the spring strut can be sought out by the pointer arrangement by moving the measuring arm, so that the perpendicular distance (a) between the plane of the brake disc and the centre of said upper fixing can be read from the position of the pointer arrangement on the measuring arm.

4,407,074

APPARATUS FOR CUTTING AND/OR SCRIBING CIRCLES AND OVALS

Buford B. Ledbetter, 1312 Southern Pky., Clarksville, Tenn. 37040

Filed Jun. 27, 1980, Ser. No. 163,861
Int. Cl.³ B43L 11/02
U.S. Cl. 33—27 H **9 Claims**



1. An apparatus for scribing circles and ovals of different width-to-length ratios, said apparatus including a table mounted for rotation about a first predetermined upright axis, a mounting arm supported above said table, generally paralleling the latter and extending along a path paralleling a radius of the axis of rotation of said table, an upright shaft journalled from said mounting arm for rotation about a second upright axis, means drivingly connecting said table and shaft for rotation of said shaft at twice the speed of rotation of said table, a support mounted on said mounting arm for guided movement therealong, a scribe tool carried by said support for engagement with and scribing a workpiece disposed on said table for rotation therewith, and motion converting and drive means operatively connected between said upright shaft and support for effecting oscillation of said support along said arm responsive to and in timed relation with rotation of said shaft.

4,407,075

ILLUMINATED SPIRIT VIAL AND LEVEL

Carl H. MacDermott, Bridgewater, and Richard S. Brown, Jr., Pembroke, both of Mass., assignors to Louis Rains, Weymouthport and Arthur Albert Smith, Jr., Norwell, both of, Mass.

Filed Dec. 3, 1981, Ser. No. 326,849
Int. Cl.³ G01C 9/32
U.S. Cl. 33—348.2 **9 Claims**

1. Illuminated spirit level suitable for use by carpenters and other tradespersons comprising:

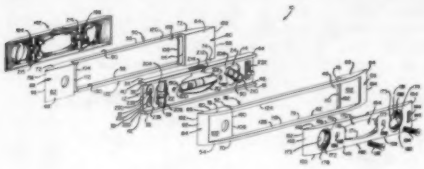
(a) an elongated body member having spaced-apart parallel, planar work contacting surfaces;

(b) at least one spirit vial cavity located in said elongated body member;

(c) at least one tubular-shaped spirit vial mounted in each said at least one spirit vial cavity, a cylindrical-shaped

plug located in at least one end of said at least one tubular-shaped spirit vial;

(d) a light source centrally disposed in said cylindrical-



shaped plug extending into said tubular-shaped spirit vial; and

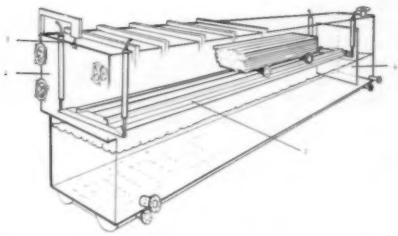
(e) means for energizing the light source intermittently as desired.

4,407,076

PROCESS FOR TREATING WOOD

Magnus F. O. Estberg, Rimbo, Sweden, assignor to Kenogard AB, Stockholm, Sweden

Filed Oct. 14, 1981, Ser. No. 311,409
Claims priority, application Sweden, Oct. 17, 1980, 8007297
Int. Cl.³ F26B *3/00, 7/00, 5/04*
U.S. Cl. 34—9.5 10 Claims



1. In the process of removing water or solvent from impregnated materials selected from the group of wood and other cellulose-based products by treating the impregnated materials with a high-boiling oil drying medium under reduced pressure conditions, the improvement which comprises accelerating said removal and reducing oil retention in said impregnated materials, by the sequential steps of:

(a) establishing a drying zone that includes a reservoir of a high-boiling oil drying medium and liquid-free zone of reduced pressure below 25 kPa thereabove, said high-boiling oil selected from the group consisting of linseed oil, tall oil, soybean oil, colza oil and mineral oils, and having a boiling point above 250° C., and said reservoir being maintained at a temperature of 60°–110° C.,

(b) introducing said impregnated material into said drying zone and immersing said impregnated material in said reservoir of high-boiling oil,

(c) thereafter removing said impregnated material from contact with said reservoir of high-boiling oil and maintaining it in said liquid-free zone of reduced pressure for a period of time,

(d) repeating steps (b) and (c) in sequence at least three times, said impregnated material being withdrawn from said high-boiling oil drying medium at least 20% of the total time that it is in said drying zone, and

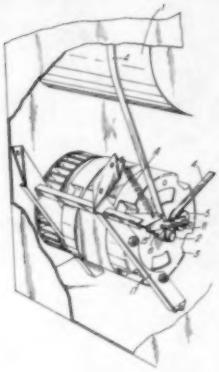
(e) ceasing the process when about as much water or solvent as introduced with the impregnated materials has been evaporated.

4,407,077

BELT DRIVE SYSTEM

Dennis E. Smith, Auckland, New Zealand, assignor to Fisher & Paykel Limited, Auckland, New Zealand

Filed Sep. 21, 1981, Ser. No. 304,059
Claims priority, application New Zealand, Oct. 24, 1980, 195362
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—108 4 Claims



1. In a drive system for driving and driven rotatable members having a high ratio of diameters so that one rotatable member is relatively small with respect to the other, a flexible endless drive belt operably engaging said rotatable members so that they rotate together, and idler pulleys engaging said belt to assist in maintaining engagement of said belt with said rotatable members, the improvement comprising an idler pulley support arm pivotally supported at one end on a support member fixed with respect to the smaller rotatable member, a pair of idler pulleys rotatably mounted in fixed spaced relationship on the other end of said support arm closely adjacent and in substantially symmetrical relationship with the smaller rotatable member with the belt passing between them in engagement with the adjacent portions of their peripheral surfaces so that the belt engaging peripheral faces of said pulleys are spaced a distance apart substantially the same as the diameter of the smaller rotatable member in engagement with said belt and a straight line passing through the centers of rotation of said pulleys is substantially normal to the portions of the belt between said pulleys and the smaller rotatable member, and a spring means resiliently urging said arm about its pivot axis towards the larger rotatable member to maintain tension on said belt and substantially prevent reversal of direction of said driving member from materially effecting power transmission between the rotatable members.

4,407,078

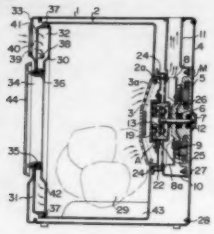
DRIVE SYSTEM FOR ROTARY DRUM TYPE DEHYDRATING APPARATUS

Kojiro Takeyama, Kawanishi, and Toru Shimotake, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 8, 1981, Ser. No. 271,269
Claims priority, application Japan, Jun. 16, 1980, 55-81914
Int. Cl.³ F26B *11/04*
U.S. Cl. 34—133 9 Claims

1. A drive system for a rotary drum type drying apparatus including an outer case having a rear surface member, a rotary drum encased in said outer case and having a rear wall, a filter disposed in the central portion of said rear wall and allowing air to be discharged from said rotary drum therethrough and a blower fan positioned adjacently to said filter, comprising:

an axial air-gap induction motor mounted rearwardly of said blower in the central portion of said rear surface member and including a rotor and a rotor shaft, said blower fan being supported by said rotor or said rotor shaft; and



a speed reduction gear unit disposed in a space defined between said filter and said blower fan and having an input connected to one end of said rotor shaft and an output connected to the central portion of said rear wall of the rotary drum.

4,407,079

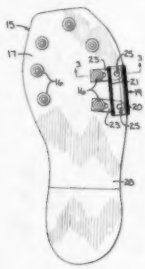
GOLF AID DEVICE

Lee M. Chiroff, 8027 S. 56th St., Franklin, Wis. 53132

Filed Jun. 4, 1981, Ser. No. 269,407

Int. Cl.³ A63B *69/36;* A43B *5/00*

U.S. Cl. 36—127 **2 Claims**



1. In combination with a golf shoe having a plurality of spikes threaded into the sole thereof, an attachment for securement to the shoe of a golfer worn on the foot that will assume the stance position closest to the target when addressing the ball, said attachment comprising a roll bar disposed beneath the sole of the shoe and spaced outwardly from the spikes adjacent to the outside edge of the shoe, said roll bar having an arcuate surface sloping toward said outside edge upon which the golfer can pivot following an impact with the ball and during the subsequent follow-through of the golf swing, a pair of linkage members attached to the roll bar and connected to corresponding spikes, said linkage members being pivotally connected to the roll bar to accommodate varying distances between the corresponding spikes as likely presented on different shoes.

4,407,080

PIVOTALLY MOUNTED RIPPING TEETH ASSEMBLY ON DOZER BLADE

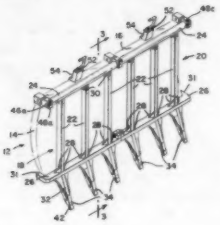
Donald B. Mann, 8811 131st Ave. Northeast, Lake Stevens, Wash. 98258

Continuation-in-part of Ser. No. 163,981, Jun. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 933,075, Aug. 11, 1978, Pat. No. 4,241,525. This application Jul. 1, 1981, Ser. No. 279,549

The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.

Int. Cl.³ E02F *3/76*

U.S. Cl. 37—117.5 **8 Claims**



1. In an assembly adapted to be pivotally secured to a blade on heavy equipment, such as a bulldozer, in either a deployed or undeployed position, and including a rigid rectangular frame having (i) a plurality of teeth projecting from one transverse edge and (ii) mounting means for pivotally securing the frame to the blade, the improvement comprising:

a tubular mounting sleeve secured to the edge of the frame opposite the teeth and a pair of forwardly projecting hangers fastened to the upper edge of the blade at opposite sides thereof, each hanger being releasably received by ears which are secured to the upper edge of the blade and receiving a pin projecting from opposite ends of the mounting sleeve so that the frame may be pivoted between the deployed position in which the frame lies along the front face of the blade and the undeployed position in which the frame projects upwardly above the upper edge of the blade.

4,407,081

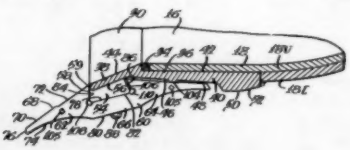
BUCKET TOOTH ATTACHMENT MEANS

Charles B. Hanson, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 7, 1981, Ser. No. 328,129

Int. Cl.³ E02F *9/28*

U.S. Cl. 37—141 T **3 Claims**



1. A bucket for use in conjunction with earth-working and material handling implements, comprising:

(a) a pair of transversely spaced sidewall plates;

(b) a backwall plate joining together said sidewall plates to define a scoop-shaped opening, one edge of said backwall plate being recessed relative to the leading edges of said sidewall plates;

(c) cutting-edge plate means carried between the leading edges of said sidewall plates ahead of said one edge of said backwall plate, said cutting-edge plate means having a plurality of downwardly extending transversely spaced

tongue portions positioned immediately inward of the leading edges of said sidewall plates and a forward portion which extends outward from said one edge of said backwall plate and a rearward portion which extends immediately below said backwall plate,

(d) generally flat reversible bucket tooth means having two oppositely disposed beveled portions removably mounted to said tongue portions, said tooth means having a transverse groove formed in the upper surface thereof intermediate to said beveled portions for receipt of said tongue portions therein as said tooth means is transversely moved into engagement therewith, the upper surfaces of said beveled portions having undercut sections on both sides of said groove and the lower surface of said rearward portion of said cutting-edge plate includes a downwardly projecting protrusion for contact with said undercut sections.

4,407,082

TAG

William J. Stehouwer, Lansing, Mich., assignor to A. J. Sparks, Grand Rapids, Mich.

Filed Nov. 13, 1981, Ser. No. 320,939

Int. Cl.³ G09F *3/18;* **A44C** *3/00;* **B65D** *77/10;* **B32K** *1/06*

U.S. Cl. 40—10 C **18 Claims**

1. A nursery tag comprising:

a polymeric body for carrying indicia thereon; and

a tie extending centrally from an edge of said body and having an end overlapping a relatively small portion of said body, said tie having a flexible wire core surrounded by a resilient polymeric material, said tie integrally ultrasonically bonded to said body in the overlying portion of said body and tie.

4,407,083

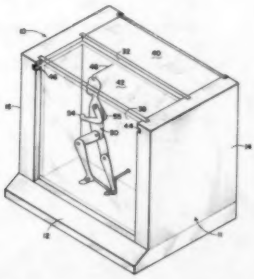
ANIMATED FIGURE AMUSEMENT DEVICE

Jimmy D. Hartgrave, 320 W. 17th, Apt. 108, Tulsa, Okla. 74119

Filed Mar. 8, 1982, Ser. No. 355,854

Int. Cl.³ G09F *19/08*

U.S. Cl. 40—414 **7 Claims**



1. An action-type decorator item comprising housing means, first and second compartments provided in the housing means, power supply means mounted within the first of said compartments, movable figurine means suspended in the second of said compartments, means operably connected between the power supply means and figurine means for transmitting motion to the figurine means to achieve a life-like movement therefor, the figurine means comprising a body simulating an animal having at least the legs thereof pivotally secured to the torso thereof whereby the action of the figurine simulates a natural movement, the legs being operably connected with the power supply for movement thereby, and including crank shaft means operably connected between the power supply means and legs for transmitting said movement thereto.

4,407,084

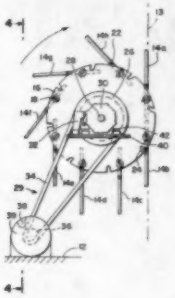
APPARATUS FOR STORING A PLURALITY OF SIGNS AND AUTOMATICALLY DISPLAYING SAID SIGNS AT PREDETERMINED TIMED INTERVALS

Robert E. Uihlein, Uniondale, and Walter C. Severson, East Meadow, both of N.Y., assignors to Signs by Severson Rent A Sign, Inc., Uniondale, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,038

Int. Cl.³ G09F *11/02*

U.S. Cl. 40—475 **3 Claims**



1. Apparatus for storing a plurality of signs and automatically displaying them at timed intervals which comprises:

(a) a rectangular box-like housing having a front window display area;

(b) an elongated shaft rotatably mounted through the bearings;

(c) a plurality of panels, each panel having a copy placed on each side, pivotally mounted off center at each end, around the periphery of the discs so that the panels will turn with the discs so they can be displayed when they reach the front display area;

(d) means for rotating the elongated shaft comprising:

(1) a motor mounted within the housing;

(2) a first pully mounted on shaft of motor;

(3) a second pully mounted on the elongated shaft;

(4) a V-belt rotatably mounted between the first pully and the second pully so that the motor rotates the elongated shaft; and

(e) means for starting and stopping the rotation of the elongated shaft at timed intervals whereby two panels on the discs will be in a proper vertical position in the front window display area in the rectangular box-like housing for viewing comprising:

(1) a brake connected to the motor;

(2) a cam having a plurality of high points and a plurality of low points around its periphery in the same number as the panels, the cam mounted to one end of the elongated shaft;

(3) a microswitch having a roller that engages the cam, the microswitch mounted within the housing and electrically connected between a power source and the motor with the brake, so that when a low point on the cam engages the roller the microswitch will be in a normally closed position allowing the voltage to go directly to the motor to turn the cam and at the same time disengage the brake;

(4) a relay mounted within the housing and electrically

connected between the power source and the motor with the brake; and

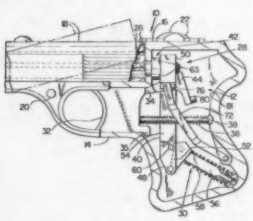
(5) a timer mounted within the housing and electrically connected between the microswitch and the relay, so that when a high point on the cam engages the roller the microswitch will be in a normally open position disconnecting the voltage to the motor and sending an electrical impulse into the timer whereby when predetermined time is reached the timer will send the impulse into the relay causing the relay to activate, supplying voltage to the motor until low point on the cam is reached again which will disconnect both the timer and the relay allowing the voltage again to go directly to the motor via the microswitch to turn the cam and at the same time disengage the brake until the next timing cycle begins again.

4,407,085

HANDGUN FIRING MECHANISM

Robert L. Hillberg, 26 Mount Sanford Rd., Cheshire, Conn. 06410, and Frederick F. Stevens, 177 Brett Rd., Fairfield, Conn. 06430

Filed Oct. 2, 1981, Ser. No. 308,427
Int. Cl.³ F41C *19/00*
U.S. Cl. 42—69 R **13 Claims**



12. In a handgun having a frame and a firing mechanism including a trigger supported on the frame for movement between ready and firing positions, a hammer assembly supported on the frame for movement between striking and tripping positions, and a mainspring normally biasing the hammer toward its striking position, the hammer assembly including a hammer and a sear pivotally supported on the hammer and engageable with another part of the firing mechanism for moving the hammer assembly from its striking position to its tripping position and releasing the hammer in its tripping position in response to movement of the trigger from its ready position to its firing position, the improvement wherein said sear has two legs and is pivotally supported on said hammer at the junction of said legs, one of said legs being engageable with said other part, said handgun includes means independent of said other part and engageable with the other of said legs for releasing said sear from engagement with said other part at said tripping position to allow said hammer to move to its firing position in response to the biasing force of said mainspring, and means for biasing said one leg toward said other part and maintaining it in engagement with said other part until said sear is released from engagement with said other part by engagement of said other leg with said independent means.

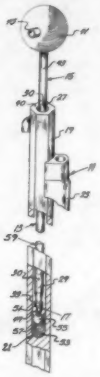
4,407,086

WEAPON

William J. Hasselmann, 2818 Orlando Dr., Pittsburgh, Pa. 15235

Filed May 21, 1981, Ser. No. 265,906
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 **5 Claims**

1. For use with a muzzle-loading gun for removal of a musket ball undesirably lodged in the breech of said gun, the instrument comprising a ramrod, having a ball starter secured at one end thereof and a screw-jag tool secured at the opposite end thereof, said ball starter and said tool each being secured at said one end and at said opposite end respectively, firmly but manually removable, said one end and the end of said ball starter which is secured to said one end being provided with mating threads which are engaged when the ball starter is secured to said one end, said opposite end and the end of said screw-jag tool secured to said opposite end being provided with mating threads which are engaged when said screw-jag tool is secured to said opposite end, and the screw-jag tool



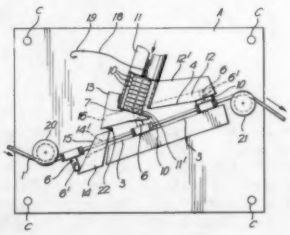
being provided with a second thread for screwing into the ball, the direction of said mating threads of said ball starter and of said one end and of said screw-jag tool and of said opposite end, and the direction of said second thread, being such that the engagement of the threads of said ball starter and of said one end and of said screw-jag tool and of said opposite end are effected by turning the starter and tool in the same direction (clockwise or counterclockwise) with reference to the axis of the ramrod and the engagement of the screw-jag tool with the ball is effected by turning the screw-jag tool in the same direction.

4,407,087

METHOD FOR ATTACHING SNELLS TO A FISHING LINE, AND AN APPARATUS FOR CARRYING OUT THE METHOD

Per Huse, Haslum, Norway, assignor to O. Mustad & Son A/S, Oslo, Norway

Filed Feb. 4, 1981, Ser. No. 231,567
Claims priority, application Norway, Mar. 3, 1980, 800598
The portion of the term of this patent subsequent to Jul. 1, 1998, has been disclaimed.
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—4 **5 Claims**



1. A method of attaching detachable snells to a fishing line

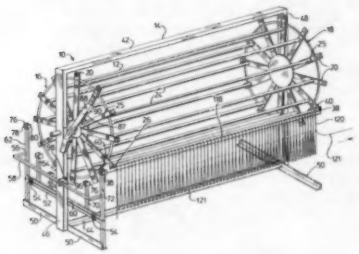
while the line system is being set out from a moving vessel at sea, the snell and the line having cooperating coupling members consisting of a peg rotatably attached to the line and having opposing stop studs at the middle section thereof, and a radially elastic ring attached to one end of the snell which is detachably fastened to the peg by being pressed down over the peg past the stop studs into a locked position behind the studs, the line with its pegs oriented in the same direction being pulled through a device for connecting the coupling members, characterized in that the pegs are guided past a discharge opening on a magazine for the rings such that an end of each peg is brought into engagement with the opening of a discharged ring and carries the ring along with it, the ring being pressed down further into a locked position on the peg in that the ring and the peg are guided between two converging surfaces, a pressure surface for the ring having a guide/clearance groove for the peg and a backstop surface for the peg.

4,407,088

METHOD AND APPARATUS FOR SUPPLYING TRAWL

Thomas A. Robertson, Sheldrake Lake, R.R. No. 3, Armdale, Halifax County, Nova Scotia, Canada B3L 4J3

Filed Jul. 2, 1981, Ser. No. 279,823
Int. Cl.³ A01K *79/00*
U.S. Cl. 43—4.5 **9 Claims**



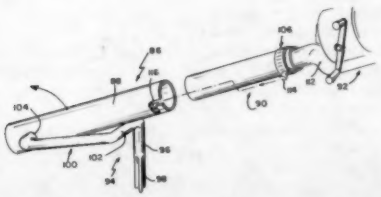
1. Apparatus for supplying a trawl comprising:
a supporting frame,
a hook rack assembly including a plurality of pivotally mounted hook racks circumferentially spaced apart in parallel arrangement, said hook rack assembly being rotatably mounted in said supporting frame for rotary advancement of each hook rack to an operative position for supplying trawl, and
means to hold said assembly against rotation when a hook rack is in said operative trawl supplying position.

4,407,089

FISHING ROD HOLDER

Joseph A. Miller, 2308 N. 23rd St., Lafayette, Ind. 47904

Filed Mar. 27, 1981, Ser. No. 248,404
Int. Cl.³ A01K *97/10*
U.S. Cl. 43—21.2 **6 Claims**



1. A fishing rod attachment including a first portion for retaining a butt and handle portion of the fishing rod, a stem portion having a first section, a second section which is generally perpendicular to the first section and is pivotally connected to the first portion and provides a region upon which the first portion rests in a use position and away from which rest region the first portion is pivotal to aid in insertion and removal of the rod from the first portion, the first portion further including, at an end of the cylinder remote from the pivotal connection, a somewhat L-shaped slot, and a strap adjustably attached to the handle portion of the fishing rod having a projection for engagement into the slot to lock the rod handle and the first portion together selectively to prevent inadvertent disengagement of the rod from the rod attachment.

4,407,090

NEEDLEWORK TOY

Kwan-sung Pyo, 619-I, Kilum-dong, Sungbook-ku, Seoul, and Moon-sung Park, 9-289, Hongun-dong, Sudaemoon-ku, Seoul, both of Rep. of Korea

Filed Sep. 4, 1981, Ser. No. 299,414
Claims priority, application Rep. of Korea, Jul. 13, 1981, 81-4969
Int. Cl.³ A63H *5/00*
U.S. Cl. 46—118 **1 Claim**

1. A toy animal mechanism, comprising:
(a) a press plate (2) having a support arm (3) extending laterally outwardly from an upper edge thereof.
(b) a spring wire (9) having two U-shaped portions joined by a connecting section (8''''), and defining a generally wedge-shaped space (10) between legs of the U-shaped portions,
(c) an air bellows (12) having a crying whistle (11) mounted therein disposed within said wedge-shaped space,
(d) clamping means (2') mounting the spring wire connecting section to the press plate proximate the support arm,
(e) a pair of U-shaped levers (4) each having an elongate foreleg plate (6) extending outwardly therefrom,
(f) a pin member (7) pivotally coupling leg ends of said levers to an outermost end of the support arm, and
(g) apertures (5) individually provided in a leg of each lever remote from said pin member for receiving free leg ends of the U-shaped portions of the spring wire,
(h) whereby upon installation within the body of a toy animal with each elongate plate extending into a foreleg of the animal, the squeezing of the animal body acts to compress the air bellows and thereby activate the crying whistle, and to simultaneously pivot the levers and plates about the pin member to simulate foreleg movement.

4,407,091

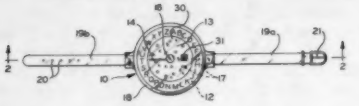
WRIST ATTACHED RATTLE AND EDUCATIONAL DEVICE FOR INFANTS

Gary W. Moody, 1010 Parkside Blvd., Toledo, Ohio 43607

Filed Jul. 27, 1981, Ser. No. 287,319
Int. Cl.³ A63H *5/00*
U.S. Cl. 46—193 **4 Claims**

1. An infant's rattle comprising a relatively small closed container providing substantial wall area, a quantity of pebble-like materials within said container to hit against the walls

thereof upon a shaking movement, strap means for attaching the container to an infant's wrist whereby loss or misplacement of the rattle is avoided and the normal movement of the infant's arm automatically produces the desired sound, a transparent cover for the top of said container, a lateral flat flange on said



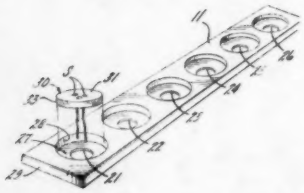
container adjacent to and within said transparent cover, a circular row of indicia of the alphabet displayed on said flange, and a manually actuated pointer for said row rotatably connected to said transparent cover for affording and educational feature to the rattle.

4,407,092

HYDROPONIC ASSEMBLY AND WAFER FOR USE THEREIN

R. Louis Ware, 1739 Chestnut Ave., Glenview, Ill. 60025

Division of Ser. No. 59,140, Jul. 20, 1979, Pat. No. 4,299,054.
This application Jul. 27, 1981, Ser. No. 287,520
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—64 **11 Claims**



1. A hydroponic assembly comprising at least one growing station formed from planar material having a through opening surrounded by a land surface and gripping means extending vertically therefrom,

a liquid container for supporting said growing station and for containing nutrient solution disposed therebeneath,

a wafer of dry compressed growing medium supported on the land surface of the growing station,

a seed receiving surface disposed on a top side of said wafer,

a wick communicating with the wafer and extending downwardly into the nutrient solution,

the wafer upon receiving nutrient solution through the wick by capillary action being capable of expanding into a porous block extending upwardly to a substantial height above said land surface to provide vertically extending lateral area so that the contained root structure will receive constant aeration.

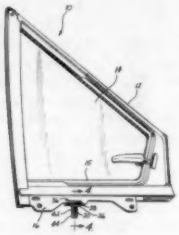
4,407,093

VENTILATING WINDOW

Steve A. Spretnjak, Elkhart, Ind., and Colin Anthony, Aurora, Canada, assignors to Excel Industries, Elkhart, Ind.

Filed Sep. 29, 1982, Ser. No. 428,422
Int. Cl.³ B60J *1/14*
U.S. Cl. 49—391 **2 Claims**

1. A ventilating window assembly for mounting in a window opening within a vehicular housing, said assembly including a rigid frame having a lower horizontal member, a glass panel located within said frame, said lower frame member having a generally circular opening therethrough, a pivot rod having opposite flat sides and connected at one end to said glass panel, said rod extending through said lower frame member opening and defining in conjunction with the periphery of the lower frame member opening opposite spaces between said rod sides and opening periphery, said glass panel being rotatable between a closed position and an open position with respect to said frame, the improvement comprising a washer including upper and lower surfaces and having a central opening, spaced projections located upon one said washer surface at opposite



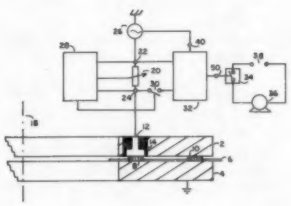
sides of said central opening therein, said washer fitted upon said rod with the rod extending through said washer central opening and said projections fitting into said spaces between the rod sides and said lower frame member opening periphery, said washer being rotational with said rod within said lower frame member opening and constituting means for restricting lateral movement of said rod within the lower frame member opening.

4,407,094

APPARATUS FOR AUTOMATIC LAPPING CONTROL

Emeric S. Bennett, Chardon, and Franz L. Sauerland, Shaker Heights, both of Ohio, assignors to Transat Corp., Shaker Heights, Ohio

Filed Nov. 3, 1981, Ser. No. 317,778
Int. Cl.³ B24B *49/04*
U.S. Cl. 51—165 R **8 Claims**



1. Control apparatus for a machine for precision machining, having at least one reference surface, one machining surface, and at least one piezoelectric resonator between said surfaces, comprising:

a. at least one electrode able to be inserted in and insulated from one of said surfaces;

b. automatic control means for sensing the resonance frequency of said piezoelectric resonator and for terminating the machining process when said resonance frequency reaches a target frequency;

c. impedance sensing means for sensing the presence and absence of a piezoelectric resonator at the electrode face and for:

deactivating said automatic control means in the absence of a piezoelectric resonator at the electrode face, and

activating said automatic control means in the presence of a piezoelectric resonator at the electrode face.

4,407,095

DEVICE FOR ABRASIVE CLEANING OF BLANKS SHAPED AS BODIES OF REVOLUTION

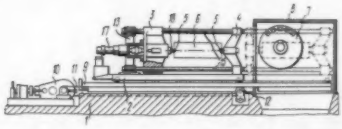
Konstantin S. Tolstopyatov, ulitsa Pervomaiskaya, 30, kv. 24, Elektrostal Moskovskoi oblasti; Anatoly A. Lukyanov, ulitsa Rogozhskaya, 100b, Noginsk Moskovsoi oblasti; Alexandr L. Pyatibrat, ulitsa Mayakovskogo, 13, kv. 16, Elektrostal Moskovskoi oblasti; Igor S. Pryanishnikov, ulitsa Nikolaeva, 23, kv. 44, Elektrostal Moskovskoi oblasti; Gennady N. Maslov, ulitsa Pervomaiskaya, 34/19, kv. 25, Elektrostal Moskovskoi oblasti; Nikolai G. Bobovnikov, ulitsa Sovetskaya, 1, kv. 43, Elektrostal Moskovskoi oblasti; Petr V. Gubin, ulitsa Nikolaeva, 23, kv. 20, Elektrostal Moskovskoi oblasti; Viktor I. Burmakin, ulitsa Stalevarov, 5, kv. 2, Elektrostal Moskovskoi oblasti; Nikolai B. Marchenkov, ulitsa Yalagina, 22, kv. 37, Elektrostal Moskovskoi oblasti; Alexandr F. Chirkin, ulitsa Stalevarov, 8a, kv. 50, Elektrostal Moskovskoi oblasti; Mikhail U. Zemtsov, ulitsa Delegatskaya, 9, kv. 110, Moscow, and Ernst L. Tonaevsky, ulitsa Sovetskaya, 64, kv. 9, Noginsk Moskovskoi oblasti, all of U.S.S.R.

PCT No. PCT/SU79/00066, § 371 Date Apr. 14, 1981, § 102(e) Date Mar. 31, 1981, PCT Pub. No. WO81/00534, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 14, 1979, Ser. No. 253,519

Int. Cl.³ B24B *5/04*

U.S. Cl. 51—112 **3 Claims**



1. A device for abrasive cleaning of blanks shaped as bodies of revolution, comprising a wheelhead with a rotating tool, a movable table mounting a headstock and a footstock carrying centers for a blank and a blank rotation drive, characterized in that a second wheelhead is mounted opposite to the first wheelhead, and the table is provided with a steady stand and two guides disposed in a vertical plane passing through the line of the centers and rigidly connected with the footstock and the stand, the headstock being mounted on the guides and adapted to move along them.

4,407,096

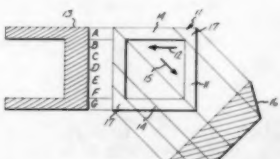
METHOD AND APPARATUS FOR SURFACE GRINDING

Clarence I. Steinback, Minneapolis, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Continuation of Ser. No. 149,905, May 15, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,497

Int. Cl.³ B24B *21/04, 1/00*

U.S. Cl. 51—328 **4 Claims**



1. A method of precision planar surface grinding a workpiece with an endless abrasive belt of predetermined width, comprising the steps of:

(a) imparting continuous circulating movement to the endless abrasive belt through a grinding area to define a region of abrasive workpiece engagement extending over the entire width of the belt;

(b) rotating the workpiece in a plane that is substantially parallel to the region of abrasive workpiece engagement of said endless abrasive belt to present a grinding surface of predetermined maximum transverse dimension to the region of abrasive workpiece engagement;

(c) effecting relative back and forth reciprocating movement between the workpiece and said region of abrasive workpiece engagement along a line that is substantially parallel to said plane of rotation, said relative movement being of sufficient magnitude that the rightmost edge of the belt reaches the leftmost edge of the rotating workpiece and the leftmost edge of the belt reaches the rightmost edge of the rotating workpiece, so that during each reciprocating stroke the entire grinding surface of the workpiece moves through the entire width of the region of abrasive workpiece engagement, whereby every point on the workpiece is abrasively engaged by every point of the endless abrasive belt.

4,407,097

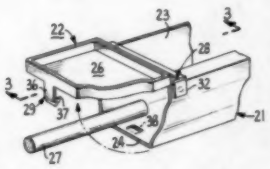
RAIN GUTTER CONSTRUCTION

Jack H. Allen, 223 SE. 122nd Ave., Portland, Oreg. 97233

Filed Feb. 15, 1980, Ser. No. 122,072

Int. Cl.³ E04D *13/00*

U.S. Cl. 52—11 **13 Claims**



1. A rain gutter construction comprising

a straight length of gutter formed for mounting along and under the eaves of a building, and

means providing access to the interior of said straight length of gutter from an end thereof,

said means comprising a member mounted for selective movement between a first position forming part of the gutter for retaining water therein and a second position permitting access to the interior of said straight length of gutter by an elongated cleaning tool.

4,407,098

LIQUID STORAGE TANK WITH STEEL-REINFORCED CONCRETE EXTERIOR

Wilfried Krabbe, Dreieich-Buchschlag, Fed. Rep. of Germany, assignor to Philipp Holzmann AG, Frankfurt, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,913

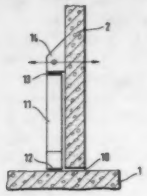
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026465

Int. Cl.² E04B *1/98*

U.S. Cl. 52—167 **6 Claims**

1. A tank for storage of liquid, especially supercooled liquid, comprising an inner tank to hold liquid and being supported on a base plate, a reinforced concrete wall surrounding said inner tank and separately supported by said base plate, with the reinforced concrete wall supported by polygonal swing plates (11) which are located at their planes parallel to said concrete wall (2) and at a distance from it, with one side of the polygo-

nal swing plate bearing on the base plate (1) and an opposite side or angle of the polygonal swing plate bearing against the



outside of the concrete wall to support the concrete wall with its bottom above the base plate.

4,407,099

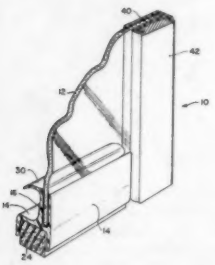
WINDOW

James A. McLaughlin, Dover, Mass., assignor to Titanseal Corporation, Dedham, Mass.

Filed Mar. 23, 1981, Ser. No. 246,572

Int. Cl.³ E06B *3/28*

U.S. Cl. 52—202 **2 Claims**



1. An extruded plastic unitary window framing strip of the type formed of extruded wall segments of about the same thicknesses and comprising a U-shaped channel therein forming means to receive the bottom edge portion of a window pane wherein said U-shaped channel is formed of

(a) a first long wall which is relatively resilient and normally slants, from bottom to top, towards

(b) a second long wall such that the distance separating said walls at the bottom thereof is about three times the width of the distance normally separating said long walls at the top thereof; said framing strip also comprising of second and lower channel opening the opposite direction from said U-shaped channel, a top end segment of which comprises in part a bottom wall of said U-shaped channel; said second long wall rising out of said top segment and forming a reinforcing member for said top segment at an intermediate position about halfway between side walls of said lower channel and thereby forming means to rigidify said top segment of said lower channel, and wherein said second long wall bears a handle extending in a direction away from said first long wall, and wherein said second long wall comprises a relatively wide base structure at the bottom thereof, and wherein said handle, on being used to lift said window, forms means to act as a lever to tighten said rigid wall against said window.

4,407,100

WINDOW FRAME ASSEMBLY WITH FRAME SHAPED LOCKING MEMBER

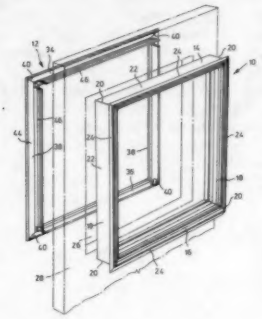
Alfred G. Huelsekopf, Newmarket, Canada, assignor to Com-Dor Supply Limited, Downsview, Canada

Filed Oct. 14, 1980, Ser. No. 196,479

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ E06B *1/04*

U.S. Cl. 52—212 **2 Claims**



1. A window frame assembly comprising:

(a) a first intermediate frame comprising a plurality of longitudinally elongated first frame lengths which butt and are secured at opposite ends to form corners of the first intermediate frame, said first intermediate frame being adapted to be inserted within a window opening in a close fitting relationship and having a flange on one side thereof for bearing against a peripheral edge of the window opening to prevent direct passage of the first intermediate frame through the window opening, locking channel formed in and extending about the periphery of the first intermediate frame, said locking channel being arranged to be accessible from the other side of said frame when the first intermediate frame is mounted in a window opening,

(b) a second intermediate frame comprising a plurality of second frame lengths which butt and are secured at opposite ends to form corners of the second intermediate frame, each of said lengths being coextensive with a corresponding length of said first intermediate frame, each of the lengths of the second frame having a one-piece locking tongue formed integrally therewith and projecting therefrom each tongue being adapted to be inserted within the locking channel of its associated first frame member, the locking tongues of each second frame length extending continuously along a major portion of the length thereof and being spaced a short distance from one another at the corners of the second intermediate frame so as to be independently flexible to facilitate the insertion of the locking tongues within the locking channels when the second intermediate frame is interconnected to the first intermediate frame.

4,407,101

BASE CONSTRUCTION FOR PANEL

Paul L. Propst, Holland; Donald A. Richardson, Kentwood, and Carl B. Hinrichs, Grand Haven, all of Mich., assignors to Stow/Davis Furniture Company, Grand Rapids, Mich.

Filed Nov. 10, 1980, Ser. No. 205,690

Int. Cl.³ E04F *19/04*; E04B *2/74*

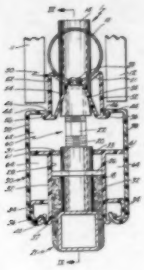
U.S. Cl. 52—126.3 **27 Claims**

1. In a wall panel base constructin comprising:

a wall panel support means for supporting said wall panel;

foot means supporting said wall panel support means;

adjustment means variably spacing said support means above said foot means defining a void therebetween;
removable cover means for covering said void; and



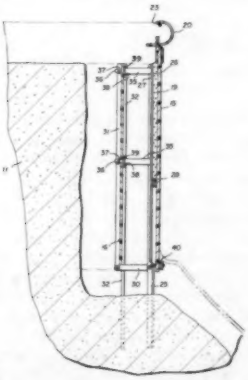
a floor seal means enveloping said foot means and extending the length of said wall panel base construction, said floor seal means engaging said floor and extending between said floor and said cover means over the spacing range of said adjustment means.

4,407,102

CONCRETE AND RESIN SWIMMING POOL WALL

John D. Boyack, 5340 Ridge Rd. West, Spencerport, N.Y. 14559

Filed Mar. 16, 1981, Ser. No. 244,106
Int. Cl.³ E02D *27/34;* E04B *1/98;* E04H *9/02*
U.S. Cl. 52—169.7 **15 Claims**



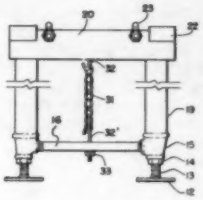
1. A swimming pool wall comprising:
a. a vertical resin wall formed of a continuous strip of resin material located at the inside surface of said pool wall;
b. vertically oriented C-shaped channels periodically adhered to the outside surface of said resin wall;
c. T-head stakes interlocked with said channels and driven into ground to support said resin wall;
d. horizontal arms extending outward from said stakes in the region of the bottom of said resin wall;
e. braces extending vertically upward from the outer ends of said arms to be approximately parallel with said stakes and spaced from said stakes;
f. a continuous strip of resin form upheld by said arms and supported vertically against said braces to be approximately parallel with and spaced from said resin wall;
g. latches extending from said stakes and through said form to latch onto and uphold said braces;
h. bars driven vertically into ground and positioned adjacent the inside of said form between said braces;
i. a horizontal strip positioned around the inside surface of the bottom region of said resin wall and screwed to said stakes through said resin wall;
j. a resin coping nose slidably mounted on the top region of said resin wall; and
k. concrete filling the space spanned by said latches and extending continuously along said pool wall between said resin wall and said form and resting on ground below said bottom region of said resin wall.

4,407,103

MOBILE UNIT SUPPORT

Robert R. Miller, 1425 Clifford St., Ridgecrest, Calif. 93555

Filed May 6, 1982, Ser. No. 375,389
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—292 **8 Claims**



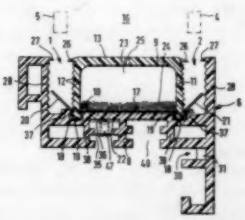
1. A structural support device for a framework of a structure comprising:
A. two flat bases;
B. legs attached to and extending perpendicularly upward from each flat base;
C. a spacer attached to each of said legs near the bases of the legs for holding said legs a predetermined distance apart;
D. a frame support assembly adapted to entrap each of said legs and to fasten to the framework of the structure to be supported;
E. means attaching said frame support assembly to said spacer in a manner whereby separation of the legs from their frame support assembly is made impossible; and
F. means attached to said frame support assembly adapted to provide cantilever support.

4,407,104

BRICK PANEL INSULATION WITH LOAD BEARING CLIP

Gerald T. Francis, 25257 W. Eight Mile Rd., Detroit, Mich. 48240

Filed Oct. 2, 1980, Ser. No. 192,943
Int. Cl.³ E04B *1/38, 2/00*
U.S. Cl. 52—309.4 **2 Claims**



1. A brick panel wall construction including a plurality of brick panels, said brick panels being secured to supporting structure, each brick panel including an insulating plastic foam backing board having a plurality of bricks secured thereto in a pattern, said brick panels including tongue and groove joints in

their longitudinal edges such that a tongue at one edge of a first brick panel being accommodated in a groove in the adjacent edge of a second panel;

at least one load bearing member being sandwiched between the tongue and groove joint between adjacent brick panels and means for attaching said member to said supporting structure, said member including a protruding lip extending into a joint area between the bricks on the adjacent panels; and

mortar applied to the spaces between the bricks on said backing boards and to the joint area between bricks of adjacent panels to cover the protruding lip of said load bearing member wherein said member providing the load bearing support for the bricks that are secured to said backing boards.

4,407,105

MULTI-PANE INSULATING GLASS AND METHOD FOR ITS PRODUCTION

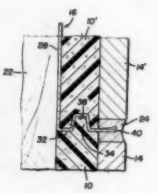
Wilhelm Frank, Rohrer Strasse 120, 7022 Leinfelden-Echterdingen 1, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,826

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948017; Nov. 29, 1979, 2948018

Int. Cl.³ E06B *3/66*

U.S. Cl. 52—397 **20 Claims**



1. An improved multi-pane insulating glass arrangement of the type having at least two parallel panes, a frame, the frame including a plurality of elongated plastic sectional rods interconnected at each end, the sectional rods having walls defining an elongated pane holding groove, each pane having edges engageably received in the holding grooves of the frame, an adhesive sealant mounted between at least a portion of a wall of the sectional rod defining the groove and the pane engaged therein, and a foil type vapor seal mounted between the panes, the improvement wherein each of the plastic sectional rods comprises a first sectional rod portion and a second sectional rod portion, said first sectional rod portion overlying at least part of said second sectional rod portion intermediate the parallel panes, and the foil type vapor seal being mounted intermediate the first and second sectional rod portions.

4,407,106

COMPLEX COLUMN

Rene A. Beck, Pully, Switzerland, assignor to Gram S.A., Fribourg, Switzerland

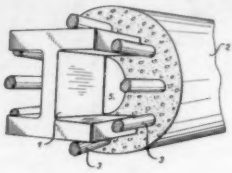
Filed Mar. 31, 1981, Ser. No. 249,364

Claims priority, application Switzerland, May 16, 1980, 3829/80

Int. Cl.³ E04C *3/34*

U.S. Cl. 52—722 **8 Claims**

1. In a complex column comprising a core formed of a metal profile embedded in a mass of concrete, both ends of the core being exposed at the ends of the column; the improvement in which said column has a hollow center extending the length said column, said core having a web that is exposed within and extends across the hollow center of the column, the interior



and exterior surfaces of the column apart from the core being of exposed concrete.

4,407,107

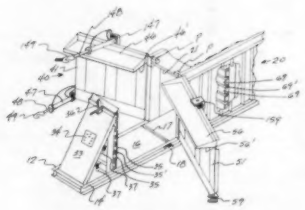
HORIZONTAL BALING APPARATUS AND METHOD

George F. Smith, Jr., Spartanburg, S.C., assignor to Hergeth, Incorporated, Spartanburg, S.C.

Continuation-in-part of Ser. No. 186,193, Sep. 11, 1980, Pat. No. 4,360,997. This application Apr. 29, 1981, Ser. No. 258,871

Int. Cl.³ B65B *11/58, 63/02*

U.S. Cl. 53—528 **11 Claims**



1. Baling and bagging apparatus comprising:

(a) a horizontal bale compression means including a baling chamber and a compression ram mounted for reciprocal movement with respect thereto, said baling chamber being defined by two end walls, a bottom wall, a top wall and two side walls, said top and side walls being moveable between a closed baling position and an open position; one said end wall being spaced apart from said compression ram to receive bagging material in overlying relation to a face of same, peripheral edge portions of said bagging material being secured out of said baling chamber for subsequent wrapping about portions of a bale to be formed, a face of said compression ram defining the other of said end walls and receive bagging material in overlying relationship thereacross, said ram defining peripheral means for receiving peripheral edge portions of bagging material therein and holding same during bale formation, said bottom wall being provided with lip means to receive a leading edge of bagging material and hold same in place during formation of bale thereover, said lip means comprising an element secured to said bottom wall and extending across same, said element having an inclined surface on the ram side of same and defining a lip therebeneath on the opposite side of same to receive said leading edge and clamp means located on opposite sides of said bottom wall to secure other peripheral edge portions of said material outside said baling chamber whereby said material is held taut during bale formation; and

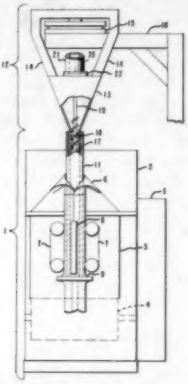
(b) means for applying strapping around said bagging after same has been wrapped about said bale and while said bale remains in the baling chamber, whereby a substantially completely wrapped bale of material may be removed from said apparatus.

4,407,108

APPARATUS AND METHOD FOR POWDER BAGGING

Stephen R. Craig, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 29, 1980, Ser. No. 220,852
Int. Cl.³ B65B 9/12, 57/14
U.S. Cl. 53—451 8 Claims



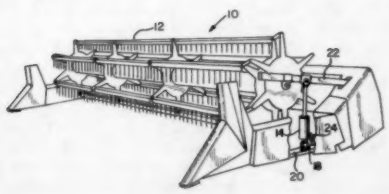
1. Apparatus for automatically filling bags, which have been automatically formed on a vertical-form-fill-seal machine, with a predetermined weight of particulate material comprising a feeder means for providing a supply of particulate material, dispensing a quantity of said particulate material, and measuring the weight of said particulate material dispensed, said feeder means comprising primary support means suitable for mounting on stationary structure or ground, weighing means mounted on said primary support means, secondary support means suspended from said weighing means, a hopper for holding a quantity of said particulate material which quantity is greater than said predetermined weight, said hopper mounted on said secondary support means, said hopper having means at or near the top for introducing said particulate material and having means at or near the bottom for dispensing said particulate material into an open bag which has been formed on a vertical-form-fill-seal machine, said weighing means being situated to measure the total weight of said secondary support means, said hopper and said particulate material in said hopper.

4,407,109

HYDRAULIC CIRCUIT FOR LIFTING THE REEL OF AN AGRICULTURAL HARVESTER

William C. Swanson, Clarendon Hills; Eugene J. Krukow, Cordova, and Norman G. Stroup, Orion, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Nov. 28, 1980, Ser. No. 210,962
Int. Cl.³ A01B 63/22
U.S. Cl. 56—11.9 2 Claims



1. In an agricultural harvester having a front mounted reel mounted for hydraulically controlled vertical adjustment, including a reservoir and a source of fluid for supplying said hydraulically controlled reel,

the combination of a pair of single acting hydraulic cylinders, one of each of said pair having a first end pivotally mounted to a header frame and second end pivotally attached to a moveable reel support beam;

a rotary flow divider having a pair of fluid transfer devices and a pair of outlet ports, each of said pair connected to one of said single acting hydraulic cylinders;

a control valve having three operating positions interposed between said source of fluid and said rotary flow divider for allowing control of said flow; and

a check valve located downstream of said control valve and upstream of said rotary flow divider arranged to prevent flow from said rotary flow divider to said control valve, said check valve pilot operated to allow flow from said rotary flow divider to said control valve when said control valve is positioned to allow flow from said rotary flow divider to said reservoir;

said rotary flow divider comprising:

a first transfer device having a given volume of hydraulic fluid capacity and an inlet port communicating with said control valve and an outlet port communicating with one of said pair of hydraulic cylinders;

a second transfer device having a volume of hydraulic fluid capacity equal to that of said first transfer device and an inlet port communicating with said control valve and an outlet port communicating with one of said pair of hydraulic cylinders;

a common shaft interconnecting said first transfer device and said second transfer device whereby said first and second transfer devices will deliver said equal volume of fluid capacity to said hydraulic cylinders when either of said transfer devices is connected to said source of fluid pressure through said control valve;

a first rephasing valve for allowing fluid to bypass one of said pair of fluid transfer devices from one of said single acting hydraulic cylinders to said source of fluid pressure; and

a second rephasing valve for allowing fluid to bypass one of said pair of fluid transfer devices from one of said single acting cylinders to said source of fluid pressure;

each of said rephasing valves set to open when the fluid volume is greater from one of said pair of hydraulic cylinders when said control valve is open allowing flow from said hydraulic cylinders to said source of fluid pressure.

4,407,110

FRAME FOR CROP HARVESTING HEADER

Irwin D. McIlwain, Lancaster, and Lawrence M. Halls, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

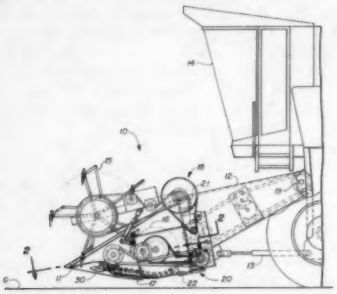
Filed Sep. 28, 1981, Ser. No. 306,552
Int. Cl.³ A01D 55/32
U.S. Cl. 56—14.4 18 Claims

1. In a crop harveting header adapted to be connected to a crop harvesting machine for severing standing crop material and conveying the severed crop material to the crop harvesting machine for further harvesting treatment, said header having a transverse frame; two forwardly extending, spaced apart sidewalls defining the width of said header; a transverse cutterbar extending between said sidewalls for severing standing crop material, said cutterbar being positioned forwardly of said frame; a plurality of attachment ribs transversely spaced between said sidewalls, said ribs being connected at opposing ends to said cutterbar and to said frame to provide support for said cutterbar along the width of said header; and a floor member extending rearwardly from said cutterbar above said support ribs along substantially the entire width of said header, an improved transverse frame comprising:

an upper transverse main beam;

a lower transverse main beam affixed to and positioned below said upper beam;

a plurality of fore-and-aft extending channel members, each said channel member corresponding to one of said attachment ribs and having a rearward end affixed to said lower beam, a forward end spaced forwardly of said rearward end and terminating between said cutterbar and said lower beam, and two spaced apart, generally vertical flange portions adjacent said rearward end, each said channel member housing a connection area adjacent said lower beam, each said connection area including pivot connection means for pivotally attaching corresponding attachment ribs to form a crop harvesting header in which the cutterbar is vertically movable relative to said frame and the floor member will flex with the cutterbar and rigid connection means for rigidly connecting corresponding attachment ribs to form a crop harvesting header having a non-flexible cutterbar and floor member such that said cutterbar is not vertically movable relative to said frame, each corresponding said attachment rib being attachable to one of said pivot connection means and said rigid connection means for selectively constructing said header; and



front transverse connection members interconnecting the forward end of adjacent channel members.

4,407,111

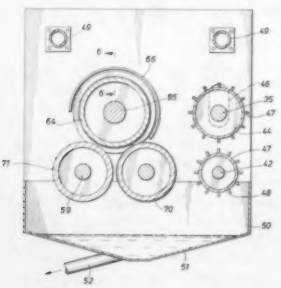
INFIELD MOBILE SYRUP EXTRACTOR

Arlen G. Brune, and Nelson Schmidt, both of Columbus, Tex., assignors to Gus Glasscock, Houston, Tex.

Filed Aug. 26, 1981, Ser. No. 296,436

Int. Cl.³ A01D *45/10*

U.S. Cl. 56—16.4 **4 Claims**



1. An apparatus for recovering a desirable syrup product from a stalk crop wherein individual stalks, after cutting from the ground, are fed into said apparatus and wherein the apparatus comprises:

(a) a pair of self-adjusting input rollers which cooperatively rotate relative to one another for engaging a stalk which is fed between said rollers and wherein said rollers include means for advancing a stalk therebetween;

(b) syrup squeezing roller means spaced from said input rollers and positioned to receive the stalks, wherein said squeezing roller means includes a pair of oppositely rotated spaced rollers having outer surfaces, which outer surfaces are grooved and mesh with one another and wherein said rollers crush the stalk crop therebetween for extracting the syrup from the stalk crop;

(c) bottom located syrup collection means for recovering liquid dripping from crushed stalks;

(d) chopper means for pulverizing the stalk crop; and

(e) blower means for ejecting the drier material recovered from stalks after recovery of syrup therefrom.

4,407,112

GRASS MOWER

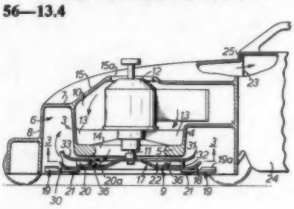
Ian C. Shepherd, Mulgrave; Ian G. Pearson, Hampton, and Donald C. Gibson, Beaumaris, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

Filed Jul. 6, 1978, Ser. No. 922,452

Claims priority, application Australia, Jul. 12, 1978, PD0813

Int. Cl.³ A01D *53/00, 87/10*

U.S. Cl. 56—13.4 **4 Claims**

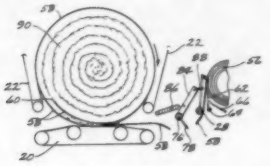


1. A rotary grass mower of the type having a hollow body with a horizontally rotatable cutting member therein, said cutting member being connected to the lower end of shaft coupled to a motor for driving the shaft and cutting member and wherein a downwardly depending skirt of the body defines the outer wall of a volutoid annular region above the periphery of the cutting member, the cutting member being in the form of a disc with cutting blades extending to the vicinity of the body skirt and said body having an opening therein above said disc, air blower means operatively connected to said motor for causing a strong flow of air to be drawn from outside the mower downwardly through said opening and then outwardly across the upper surface of said disc and upwardly into the volutoid annular region wherein is formed an energetically-swirling, tangential flow of air having an upward component effective in suspending and carrying grass clippings around the volutoid annular region and discharging them tangentially through a discharge opening leading from said volutoid annular region, said blower means comprising an annular horizontally disposed plate arranged above the disc and separated therefrom by vertically disposed blower blades which are attached to both the plate and the disc so that in operation air is drawn axially downwardly along the drive shaft past said opening in said body and into a central blower intake opening defined by said annular plate.

4,407,113
METHOD AND MEANS FOR WRAPPING ROUND BALES

Grant M. Core, Rte. #3, Knoxville, Iowa 50138

Filed Jun. 15, 1981, Ser. No. 273,468
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 8 Claims



1. In combination with a round bale baling machine having a frame, which supports on said frame, a baling chamber; and a wrapping device for wrapping a flexible sheet around a formed bale in said baling chamber, said wrapping device comprising,

a shaft means on said frame forwardly of said baling chamber, and a roll of wrapping material on said shaft,

a plate means adjacent said roll for separating a layer of said material as such layer unwinds from said roll,

guide means on said frame for directing said layer to said baling chamber,

cutting means for selectively cutting said layer to separate the portion of said layer in said baling chamber from said roll,

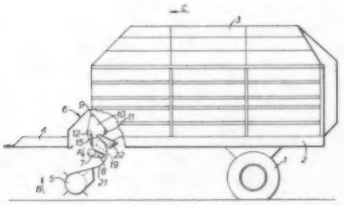
power means operatively secured to said roll for providing said roll with an initial rotational motion; and

said power means being an electric motor with an overriding clutch operatively imposed between said motor and said roll so that said roll can rotate when said motor is not operational.

4,407,114
AGRICULTURAL IMPLEMENT

Petrus W. Zweegers, Nieuivendijk 46, Geldrop, Netherlands

Filed Jun. 24, 1981, Ser. No. 277,016
Claims priority, application Netherlands, Jul. 1, 1980, 8003790
Int. Cl.³ A01D *87/00, 55/20*
U.S. Cl. 56—344 6 Claims

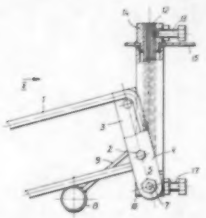


1. An agricultural implement, particularly a pick-up wagon, comprising a pick-up member (5) for picking-up crop lying on the ground, an advance mechanism located behind the pick-up member (5) viewed in the intended direction of displacement of the crop and having fingers (15) movable to and fro in a passage for displacing the crop towards stationary cutters (22) mounted in said passage behind the range of the movement of the fingers and a plurality of rotating cutters (8) rotatable about an axis (7), so that said rotating cutters (8) during rotation will pass through said passage and together with said moving fingers will displace the crop towards said stationary cutters (22) which have been disposed such that cutting edges of said stationary cutters (22) extend substantially tangential to a circle described by the free ends of said rotatable cutters (8) which move between the fingers (15) of the advance mechanism.

4,407,115
HAYMAKING MACHINE

Ulrich Wessel, and Albrecht Scherer, both of Gottmadingen, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG (Branch Establishment Fahr), Gottmadingen, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,574
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028350
Int. Cl.³ A01D *78/00, 80/02*
U.S. Cl. 56—370 4 Claims



1. In a haymaking machine having two raking wheels mounted rotatably upon a machine frame about respective approximately vertical axes so as to be driven in the same sense or in opposite senses, and an array of prongs on each of said wheels engageable with crops material and deflectible against elastic force, the improvement which comprises for each prong:

a tube piece extending parallel to the axis of rotation of the respective wheel and secured thereto;

a torsion spring formed by a stack of spring-steel strips extending in said tube piece;

means for securing one end of said stack to said tube piece, the other end of said stack being free to rotate relative to said tube piece; and

means for connecting a respective prong to said other end of said stack with the prong extending outwardly from the respective axis of the respective wheel so that each torsion spring presents the same spring characteristic to the prong in both senses of rotation of the respective wheel.

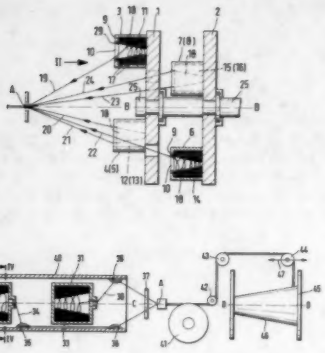
4,407,116
APPARATUS OR STRANDING WIRE

Werner Henrich, Am Wachtgipfel, D-6349 Hörbach, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,382
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035208
Int. Cl.³ D07B *3/04, 3/06*
U.S. Cl. 57—13 16 Claims

1. In an apparatus for stranding wire and the like, the combinantion of at least one support rotatable about an axis of rotation, means non-rotatably mounted on each said support for retaining loosely therein a plurality of bundles of wound wire to be stranded, said bundles of wound wire each having an axis thereof substantially parallel to said axis of rotation, each wire bundle being retained against rotation around its axis, and means for guiding the wire directly taken off from the interior

of a bundle in a said retaining means to a stranding point such that each bundle maintains its original outline and remains in



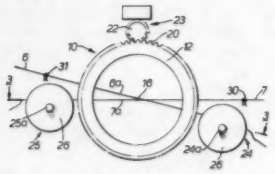
position within its respective receptacle as wire is taken off from the bundle.

4,407,117

JOINING OF YARNS BY SPLICING

Russell K. Garnsworthy, 1 Fenland Ct., Highton, Victoria, Australia

Filed May 5, 1981, Ser. No. 260,553
Claims priority, application Australia, May 5, 1980, PE3407
Int. Cl.³ D01H *15/00*
U.S. Cl. 57—22 **18 Claims**



1. A method for the splicing of two twisted staple yarns by untwisting portions of each yarn, drafting said portions to part the yarns and form two beards and retwisting the beards to form a splice, characterized in that the untwisting is effected by rolling the yarns between two surfaces at nip point to rotate the yarns.

4,407,118

GAS TURBINE ENGINE FUEL CONTROL SYSTEM

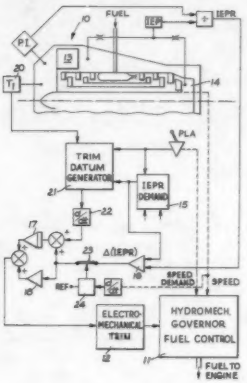
Robert G. Burrage, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 30, 1981, Ser. No. 279,031
Claims priority, application United Kingdom, Jul. 10, 1980, 8022567
Int. Cl.³ F02C *9/28*
U.S. Cl. 60—39.281 **1 Claim**

1. A fuel control system in an engine said system including a hydromechanical speed governor fuel control influenced by a control input element operable by an operator of said engine, wherein said influence of said control input element is varied by an electro-mechanical trim device controlled by an electronic control circuit responsive to at least one engine parameter, said circuit includes:

error signal generating means for producing an error signal representing any difference between a desired and an actual value of said engine parameter;

a proportional-plus-integral controller circuit means, responsive to said error signal and including an integrator, for producing an output signal which is applied to said electromechanical trim device;



means for generating a trim datum signal dependent on the control input; and

a differentiating circuit to which the trim datum signal is applied, the output of the differentiating circuit being applied to the input of said integrator.

4,407,119

GAS GENERATOR METHOD FOR PRODUCING COOL EFFLUENT GASES WITH REDUCED HYDROGEN CYANIDE CONTENT

Richard A. Biddle; Calvin W. Vriesen, both of Newark, Del., and Ernest S. Sutton, Landenberg, Pa., assignors to Thiokol Corporation, Va.

Division of Ser. No. 35,956, May 4, 1979, Pat. No. 4,298,412.
This application Mar. 12, 1981, Ser. No. 243,020
Int. Cl.³ C06D *5/06*
U.S. Cl. 60—219 **1 Claim**

1. A process for the generation of a gas having a temperature of less than about 575° C. and less than about 0.7 mole % HCN which comprises:

(a) compounding and curing a gas generant composition consisting essentially of a binder component, a polynitrate ester plasticizer component, N,N'-dihydroxyethane diamide, and a HCN scavenger component selected from cupric oxalate, ferrous oxalate, Fe_3O_4, or mixtures thereof;

(b) igniting the gas generant composition of step (a) to generate combustion gases; and

(c) causing the combustion gases generated in step (b) to pass through a coolant bed of sodium bicarbonate, ammonium tartrate or guanidine carbonate.

4,407,120

THRUST REVERSER GEARED LINKAGE

Richard H. Timms, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

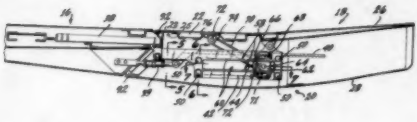
Filed Aug. 25, 1980, Ser. No. 180,671
Int. Cl.³ F02K *1/00, 3/02*; B64C *15/00*
U.S. Cl. 60—226.2 **5 Claims**

1. An improved thrust reversing apparatus for reversing the fan or total gas stream of turbofan jet engine having a central plug nozzle, surrounded by a cowl which forms a duct therebetween, said cowl having a fixedly positioned forward section and an aft translatable cowl section, an opening is formed

between said cowl sections when said aft cowl section is translated aft comprising:

a plurality of rotatable blocker doors associated with said aft translatable cowl section for substantially reversing the normally rearward directed flow of said gas stream when rotated to a deployed position and defining a portion of the duct when in a stowed position; and

mechanism for rotating each of a plurality of blocker doors, said mechanism comprising a pinion gear rotatable about



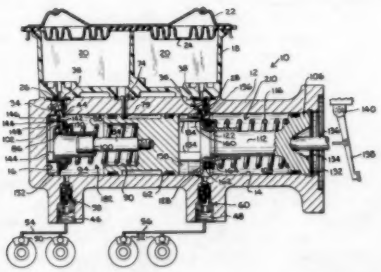
an axle shaft, a pair of opposing gear racks for engagement with said pinion gear, one of said racks fixedly attached to the forward cowl section, and at least one link member pivotly attached to said pinion gear at an off center location at a first end and to one of said blocker doors at a second end, whereby the translation of the translatable cowl section rotates the pinion gear along the racks about said axle shaft causing the attached link member to translate and rotate causing the blocker doors to rotate into and block off the duct.

4,407,121

MASTER CYLINDER

Donald A. Crumb, Mishawaka, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 29, 1981, Ser. No. 258,827
Int. Cl.³ B60T 11/20
U.S. Cl. 60—562 **13 Claims**



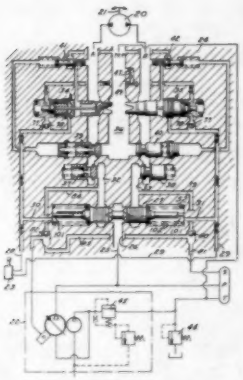
1. A master cylinder comprising a piston reciprocably received in a bore defined by a housing and cooperating with the latter to bound a variable-volume pressure chamber, said housing defining an inlet communicating liquid into said pressure chamber, a valve device disposed in said inlet having an operating stem extending into said bore, tilting of said operating stem moving said valve device between open and closed positions, first resilient means for yieldably biasing said piston to a nonbraking location, said piston being movable to a braking location in response to an operator input force to contract said pressure chamber, and valve actuating means associated with said piston for opening and closing said valve device in response to respective movement of said piston between said nonbraking location and said braking location, characterized by said valve actuating means including an annular spring seat disposed in said bore and engaging a surface bounding said pressure chamber, said spring seat opposing said first resilient means, a shaft received in said pressure chamber and reciprocable in unison with said piston, a valve actuating collar slidably carried on said shaft and movably received in said annular spring seat, said shaft and said valve actuating collar including coacting abutment means for defining a first relative position thereof, said valve actuating collar in said first relative position engaging said operating stem to open said valve device when said piston is in said nonbraking position, second resilient means interposed between said spring seat and said actuating collar to urge the latter to move in follow-up relationship in said first relative position with said piston as said piston moves from said nonbraking position toward said braking position, whereby said operating stem tilts to close said valve device, and said valve actuating collar defines an aperture therein, said annular spring seat including an axially extending leg movably extending through said aperture to engage said surface.

4,407,122

POWER TRANSMISSION

Vinod K. Nanda, Rochester, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed May 18, 1981, Ser. No. 264,342
Int. Cl.³ F15B 7/04
U.S. Cl. 60—452 **5 Claims**



1. A hydraulic control system comprising

a hydraulic actuator having opposed openings adapted to alternately function as inlets and outlets for moving the element of the actuator in opposite directions,

a load sensing variable displacement pump for supplying fluid to said actuator,

meter-in valve means to which the fluid from the pump is supplied,

a pair of lines extending from said meter-in valve means to said respective openings of said actuator,

said meter-in valve means being pilot controlled by alternately supplying fluid at pilot pressure to said meter-in valve means for selectively controlling the flow of fluid to the lines and thereby direction of movement of the actuator,

meter-out valve means separate from and operable independently of said meter-in valve means associated with each opening of the actuator for controlling the flow out of said actuator,

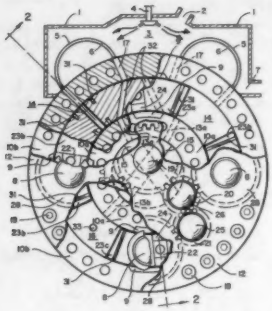
said meter-out valve means being pilot operated by the pilot pressure,

and means for sensing the outlet pressure being directed to the actuator when the meter-in valve means is operated and providing a pressure proportional to outlet pressure on said meter-in valve means opposing the force of pilot pressure tending to actuate the meter-in valve means.

4,407,123
HOT GAS STIRLING CYCLE PISTON ENGINE

George R. Morgan, 1831 S. Berthed Pl., Tucson, Ariz. 85710

Filed Oct. 20, 1980, Ser. No. 198,586
Int. Cl.³ F02G 1/04
U.S. Cl. 60—525 1 Claim



1. A hot gas Stirling cycle engine in which a plurality of gases are alternately expanded and compressed in closed thermodynamic systems comprising:

a toroidal cylinder with four double-ended pistons which oscillate around the central axis in a fixed phase relationship;

a transmission means operatively coupling each piston with a respective rotatable crankshaft, each of the crankshafts being mounted perpendicular to the central axis of the toroidal cylinder;

an output shaft located in the proximity of and parallel to the cylinder axis, and operatively coupled to each of said rotatable crankshafts;

said pistons and their respective crankshafts being radially disposed and equally spaced within said cylinder;

a first working space defined by a first piston and an adjacent second piston in which heated gas expands to perform work in moving said pistons;

a second working space defined by the second piston and an adjacent third piston in which a cooled gas is compressed;

a third working space defined by the third piston and an adjacent fourth piston in which a cooled gas in compressed;

a fourth working space defined by the fourth and first piston in which a heated gas expands to perform work in moving said pistons;

a first heating means external of said cylinder providing a heat source for gas flowing into said first working space, a second heating means external of said cylinder providing a heat source for gas flowing into said fourth working space;

a first regenerator-cooler unit located near the axis of the toroidal cylinder and located in a gas passage connecting the first and third working spaces;

a second regenerator-cooler unit located near the axis of the toroidal cylinder and located in a gas passage connecting the second and fourth working spaces;

whereby a first working gas is heated by said first heating means, flows into said first working space where it expands to perform work, flows through the first regenerator-cooler to said third working space where it is compressed, and thereafter flows through said first regenerator-coder and thence to said heater to cyclically perform a first Stirling cycle,

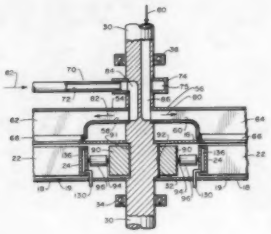
wherein a second working gas is heated by said second heating means, flows into said fourth working space where it expands to perform work, flows through the second regenerator-cooler to said second working space where it is compressed, and thereafter flows through the second regenerator-cooler and thence to said heater to cyclincally perform a second Stirling cycle;

wherein said first and second cycles are 180° out of phase with one another.

4,407,124
MEMORY POWER ENGINE

Ronald L. Pelley, Box 385, Fillmore, Calif. 93015

Filed Jan. 5, 1981, Ser. No. 222,305
Int. Cl.³ F03G 7/06
U.S. Cl. 60—527 6 Claims



1. A mechanism for transforming heat energy into mechanical energy comprising:

one or more deformably shape memory elements responsive to form change at a predetermined transition temperature;

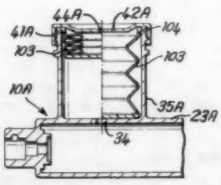
means for sequentially directing heating and cooling fluids to the surfaces of the shape memory elements whereby deformation of the shape memory elements may occur below said transition temperature and recovery may occur above said transition temperature;

means of heating the ends or attachment points of said elements whereby the shape memory material at or near said ends or attachments will be assured of being above the transition temperature during the shape memory element recovery; and means attached to each element for deforming said element and for receiving and utilizing the energy output of each said element as it transfers through said transition temperature.

4,407,125
LIQUID PRESSURE APPARATUS

David Parsons, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Continuation of Ser. No. 676,474, Apr. 13, 1976, abandoned.
This application Jun. 1, 1978, Ser. No. 911,477
Claims priority, application United Kingdom, Apr. 14, 1975, 15283/75
Int. Cl.³ B60T 11/30
U.S. Cl. 60—584 2 Claims



1. A method of assembling friction clutch release apparatus on a motor vehicle, the apparatus comprising a driver operable master cylinder which has a driver operable piston slidable in it and a liquid pressure outlet port, and a slave cylinder which has an inlet and an output thrust member, the apparatus being

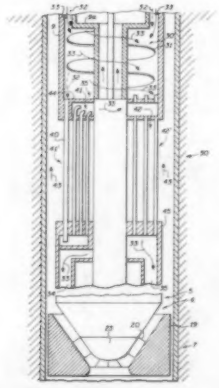
operable by displacement of liquid under pressure from the master cylinder to the slave cylinder to generate a clutch release thrust by way of the output thrust member, there being a liquid reservoir which forms a liquid containing chamber and which has a port which communicates with the liquid containing chamber below the normal level of liquid contained therein, said port being in communication with a port in the master cylinder which is open when the master cylinder piston is at the end of its stroke remote from the master cylinder outlet so that the liquid containing chamber of the reservoir is in communication with the bore of the master cylinder between the master cylinder piston and the liquid pressure outlet, and being closed when liquid is displaced under pressure from the master cylinder through the liquid pressure outlet by movement of the master cylinder piston towards the liquid pressure outlet, and a vent port which communicates with the liquid containing chamber of the reservoir above the normal level of liquid contained therein and which places the space within the liquid containing chamber that is above the normal level of liquid therein in communication with an air space which is at a pressure which is substantially atmospheric, wherein the method comprises filling the apparatus with liquid, bleeding that apparatus before that apparatus is installed on a motor vehicle, and providing an impermeable barrier to prevent leakage of liquid through said vent port during shipment and installation on a motor vehicle, said impermeable barrier being provided by closing the vent port temporarily after the apparatus is bled.

4,407,126

THERMOSYPHON BOILER FOR A GEOTHERMAL PUMPING SYSTEM

Andrej M. R. Aplenc, Jackson, Miss., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,498
Int. Cl.³ F03G 7/00
U.S. Cl. 60—641.4 **4 Claims**



1. An improved geothermal pumping system of the type having a boiler for vaporizing a working fluid with thermal energy from geothermal brine and a turbine driven pumping unit which is disposed in the geothermal brine and which is driven by the vaporized working fluid, wherein the improvement comprises:

means for separating liquid droplets from the vaporized working fluid emitted from said boiler;

means for collecting said liquid droplets;

a first plurality of tubes, operatively coupled to said liquid collecting means and disposed in a heat transfer relationship to an upwardly flowing geothermal fluid, for evaporating the collected liquid; and

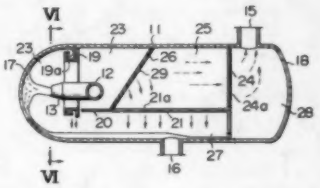
a second plurality of tubes, responsive to the vaporized working fluid emitted from said boiler and to the output of said first plurality of tubes and disposed in a heat transfer relationship to the upwardly flowing geothermal brine, for superheating the evaporated liquid emitted from said first plurality of tubes and the vaporized working fluid emitted from said boiler.

4,407,127

FLASHING APPARATUS OF GEOTHERMAL POWER PLANTS

Yoshihiro Shiraki, Tokyo, and Tokumitsu Kojima, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 14, 1981, Ser. No. 302,089
Claims priority, application Japan, Sep. 22, 1980, 55-130752
Int. Cl.³ F03G 7/04
U.S. Cl. 60—641.5 **4 Claims**



1. A flashing apparatus for a geothermal power plant comprising:

a horizontal cylindrical container closed at both ends by end plates one of which has a hemi-spherical surface, said container being provided with an underground hot water inlet at a central portion of a peripheral wall of said container;

a nozzle connected to said hot water inlet and directed towards said hemi-shperical surface of said one end plate;

means for catching and removing hot water drain after the hot water has been ejected against said hemi-spherical surface of said one end plate, said means being located near said one end plate and disposed concentrically with said nozzle;

a first partition plate attached to an inner peripheral surface of said container and provided with a plurality of through holes;

a second partition plate located horizontally in said container and connected to a lower end of said first partition plate so as to define a flashing chamber between said first partition plate and said one end plate, said drain catching means being positioned in said flashing chamber, said second partition plate having an extension extending horizontally and being provided with a plurality of through holes to thereby define a drain discharge chamber between said extension and a lower peripheral wall of said container;

a drain outlet provided for the lower peripheral wall of said container to remove the drain in said drain discharge chamber;

a third partition plate provided with a plurality of through holes and located near the other one of said end plates so as to define a steam discharge chamber between said third partition plate and said other end plate and also define a chamber for separating and removing water drops contained in flashed steam generated in said flashing chamber between said first and third partition plates and said extension of said second partition plate; and

a steam outlet provided for an upper peripheral wall of said container to feed steam in said steam discharge chamber into a steam turbine of the geothermal power plant.

4,407,128

FUEL BURNERS

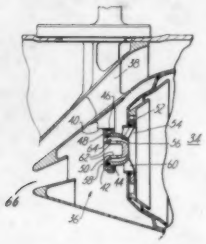
William C. T. Kwan, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 11, 1980, Ser. No. 186,267

Claims priority, application United Kingdom, Sep. 13, 1979, 7931778

Int. Cl.³ F02C 7/22

U.S. Cl. 60—737 10 Claims



1. A gas turbine fuel burner comprising a fuel manifold arranged to receive fuel from a fuel feed arm, a flow passage having a surrounding outer surface, the flow passage comprising an annular converging section supplied with air, and fuel from the fuel manifold for mixing of fuel and air and having a diverging section supplied with further air and a throat located therebetween, said flow passage being defined in part at its outer surface by an annular intermediate member, said annular intermediate member having a portion converging to said throat and a portion diverging downstream of said throat, said annular converging section of said flow passage being defined between the converging portion of said annular intermediate member and a hollow inner member, said hollow member having a closed downstream end and an open upstream end, the downstream end of said inner member being located at said throat of said flow passage, first radial swirling means in said inner member for supplying air to said annular converging section of said flow passage, second axial swirling means in said annular intermediate member downstream of said throat for supplying air to said diverging section of said flow passage, and fuel swirling means in said annular intermediate member upstream of said throat for supplying fuel from said fuel manifold to said annular converging section of said flow passage.

4,407,129

CLOSED LOOP SOLAR COLLECTING SYSTEM OPERATING A THERMOELECTRIC GENERATOR SYSTEM

Barry W. Johnston, 1622 Que St., NW., Washington, D.C. 20009

Division of Ser. No. 146,424, May 5, 1980, Pat. No. 4,354,483, and a continuation-in-part of Ser. No. 43,799, May 30, 1979, Pat. No. 4,286,579. This application Apr. 13, 1982, Ser. No. 368,085

Int. Cl.³ F03G 7/02

U.S. Cl. 60—641.8 4 Claims

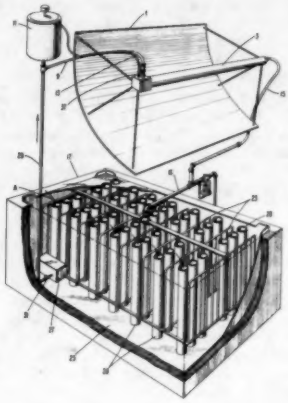
1. A combined solar energy collecting and electric energy generating system, comprising:

a closed loop solar energy collector system which includes a fluid receiver for collecting solar energy;

fluid supply means, connected to said fluid receiver for supplying a quantity of vaporizable heat transfer fluid to said fluid receiver;

means attached to said receiver for precisely metering a quantity of heat transfer fluid into said receiver from said supply means; and

a heat exchanger means, connected to said fluid receiver for absorbing heat energy from the heat transfer fluid which is vaporized in said receiver and transferring said heat energy to a working fluid circulating in said heat exchanger in thermal contact with said heat transfer fluid, the vaporized heat transfer fluid condensing after releasing its latent heat of vaporization to said heat exchanger, the condensed fluid flowing under pressure provided by the vaporized fluid entering said heat exchanger means, to said supply means; and



an electric energy generating system including a fluid-powered electrical generator system connected in fluid flow relationship to said heat exchanger to receive said heated working fluid, said working fluid thereby driving said generator, and means for returning exhausted working fluid from said generator system to the heat exchanger means.

4,407,130

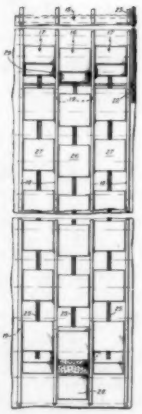
DRIVE OPERATED BY RECEPTACLES ALTERNATELY WATER FILLED AND RENDERED BUOYANT

William R. Jackson, Rocky Dundee Rd., West Buxton, Me. 04093

Filed Jun. 19, 1981, Ser. No. 275,322

Int. Cl.³ F03B 9/00

U.S. Cl. 60—496 13 Claims



1. Apparatus for use in a relatively deep body of water or other fluid to provide a drive, said apparatus including at least two units, the lower end of one close to the lower end of the other, each unit including supporting structure within said

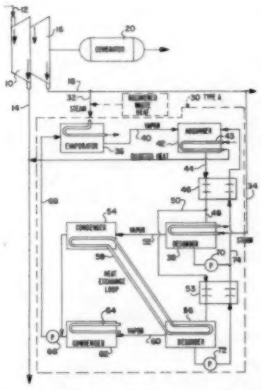
body, upper and lower sprockets rotatably connected to said structure, chains trained about said sprockets, and a series of open ended receptacles attached to said chains and uniformly spaced from each other with all receptacles opening in the trailing direction, said units closely spaced with the chain courses that are to travel upwardly proximate, means to deliver a stream of buoyant fluid under pressure into an ascending receptacle of one of the units thereby to render that receptacle buoyant, said one unit the main and the other unit an auxiliary unit, said receptacles so positioned that the ascending ones of the auxiliary unit may receive buoyant fluid bypassing lower ascending receptacles of the main unit or escaping from the proximate sides thereof.

4,407,131

COGENERATION ENERGY BALANCING SYSTEM

William H. Wilkinson, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Aug. 13, 1980, Ser. No. 177,680
Int. Cl.³ F01K *17/06*
U.S. Cl. 60—648 **25 Claims**



1. A steam and electrical power cogeneration system for an industrial plant comprising in combination:

(a) means for generating electrical power from steam, said means including a source of steam and a turbine having at least one high pressure extraction stage and at least one lower back-pressure stage,

(b) means for extracting steam from said at least one high pressure stage to supply high pressure process steam needs for said plant,

(c) means for discharging steam from said at least one back-pressure stage to supply low pressure process steam needs for said plant, and

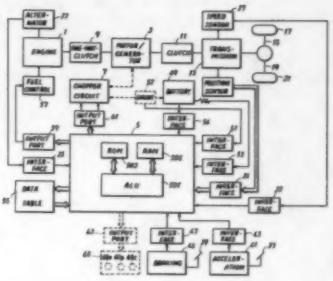
(d) means for boosting low pressure steam to a higher pressure and temperature to supply a portion of said high pressure process steam needs for said plant, said boosting means requiring a source of heat for operation, said source of heat provided by heat energy from a portion of said low pressure steam from said back-pressure stage.

4,407,132

CONTROL APPARATUS AND METHOD FOR ENGINE/ELECTRIC HYBRID VEHICLE

Shiro Kawakatsu, Suita, and Shoji Honda, Toyonaka, both of Japan, assignors to Daihatsu Motor Co., Ltd., Ikeda, Japan

Continuation of Ser. No. 123,057, Feb. 25, 1980, Pat. No. 4,305,254. This application Dec. 14, 1981, Ser. No. 330,433
Int. Cl.³ F02B *73/00*
U.S. Cl. 60—716 **1 Claim**



1. An apparatus for controlling a hybrid vehicle having wheels, an internal combustion engine having a throttle, throttle control means for controlling an opening degree of said throttle, an electric motor, a battery for supplying an electric power to said electric motor, motor control means for controlling said electric power fed from said battery to said electric motor, transmitting means for transmitting a driving power of at least said internal combustion engine and said electric motor to said wheels of said hybrid vehicle, and speed adjustment means for being operated for speed adjustment of said hybrid vehicle, comprising:

revolution number providing means responsive to the movement of said hybrid vehicle for providing data concerning the number of revolutions determinable as a function of the speed of said movement of said hybrid vehicle and adaptable to the number of revolutions of said internal combustion engine and the number of revolutions of said electric motor;

required torque data providing means for determining required torque required by said hybrid vehicle in response to the data provided by said revolution number providing means and the output of said speed adjustment means; and

control means for controlling said throttle control means and said motor control means in a manner that when said required torque exceeds a predetermined upper limit value of a torque range of said internal combustion engine and when said data concerning the number of revolutions determinable is within a predetermined range of the number of revolutions of said internal combustion engine in which said internal combustion engine is permitted to operate said internal combustion engine will be operated at said predetermined upper limit value and said electric motor will be operated at a motor torque equal to a difference between said required torque and said predetermined upper limit value.

4,407,133

SELF-CONTAINED PORTABLE TEMPERATURE-CONTROLLED CHAMBER FOR MEDICATIONS AND THE LIKE

Glenn V. Edmonson, 1434 Roxbury Rd., Ann Arbor, Mich. 48104

Filed Aug. 10, 1981, Ser. No. 291,794
Int. Cl.³ F25B *21/02;* **F25D** *3/08*
U.S. Cl. 62—3 **13 Claims**

1. A personal, self-contained, manually portable tempera-

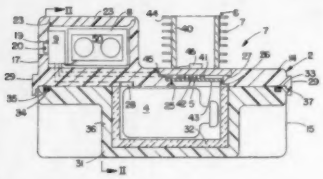
ture-controlled chamber for medications and the like, comprising:

an insulated housing having a cavity shaped to receive a receptacle of temperature-sensitive material therein;

a thermoelectric element mounted in said housing, and having first and second heat-transfer faces; one of said faces being in heat-transfer relation with said housing cavity, for transferring heat therebetween;

a heat exchanger connected with said housing, having a first portion thereof in heat-transfer relation with the other of said thermoelectric element heat-transfer faces, and a second portion thereof communicating with ambient atmosphere for exchanging heat therewith;

a source of portable electric power mounted in said housing to provide a self-contained unit that can be hand-held and



manually transported; said electrical power source being electrically connected with said thermoelectric element;

means for reversing the polarity of the electric power applied to said thermoelectric element, whereby said thermoelectric element can selectively heat or cool said housing cavity to maintain the receptacle of temperature-sensitive material therein at a desired temperature range; and

a multiple-set-point temperature controller apparatus mounted on said housing, including means for sensing the temperature in said housing cavity; said temperature controller apparatus having portions electrically connected between said electric power and said thermoelectric element to control electric current flow therebetween, and thereby automatically maintain the temperature within said housing cavity at the desired temperature range by selective heating and/or cooling.

4,407,134

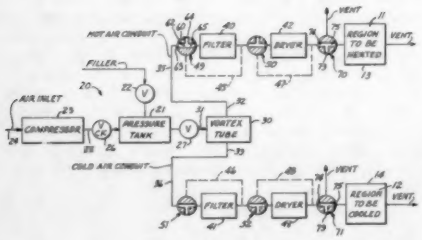
AIR CONDITIONING SYSTEM

Alvin A. Snaper, 2800 Cameo Circle, Las Vegas, Nev. 89107

Filed Nov. 19, 1981, Ser. No. 323,054

Int. Cl.³ F25B *9/02*

U.S. Cl. 62—5 **11 Claims**



1. A conditioner system for air comprising: a source of air under pressure, said source comprising a compressor and a pressure tank having an inlet and an outlet, valve means to admit air under pressure, and valve means adapted to hold air in said tank or to release it to the inlet of the vortex tube; a vortex tube of the type which whirls air and in the process raises the temperature of the air in one region and cools it in other regions, said vortex tube including an inlet receiving air under pressure from said source, a hotter air outlet discharging the hot air from one region and a colder air outlet discharging the colder air from the other region; and a conduit means for conveying air from one of said outlets to a region to be treated by air conveyed by the conduit means from the respective outlet; valve means for selectively directing hot, cold or hot and cold air to the region to be treated, whereby said region is treated with a blast of hot, cold or hot and cold air as a result of releasing air flow, said pressure tank to rapidly heat or cool said treated region.

4,407,135

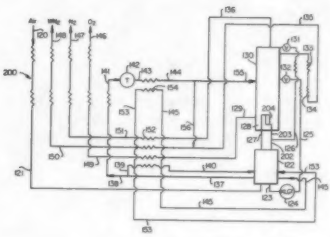
AIR SEPARATION PROCESS WITH TURBINE EXHAUST DESUPERHEAT

Ravindra F. Pahade, North Tonawanda, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 9, 1981, Ser. No. 328,817

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—13 **17 Claims**



1. In a process for the separation of air by rectification wherein feed air at greater than atmospheric pressure is cooled substantially to its dew point and is subjected to rectification in a high pressure column and a low pressure column, and wherein a first stream, having an oxygen concentration of from about 10 percent to that of air, is warmed by partial traverse against said cooling feed air, said first stream then sequentially being expanded and introduced into said low pressure column, the improvement comprising:

(1) withdrawing from said high pressure column a second liquid stream;

(2) cooling said first stream after expansion but before introduction into the low pressure column by indirect heat exchange with said second stream; and

(3) returning said second stream to the high pressure column.

12. In a process for the separation of air by rectification wherein feed air at greater than atmospheric pressure is cooled substantially to its dew point and is subjected to rectification in a high pressure column and a low pressure column, and wherein a first stream having a composition substantially that of air is warmed by partial traverse against said cooling feed air, said first stream then sequentially being expanded and introduced into said low pressure column, the improvement comprising:

(A) dividing the cooled feed air into a major fraction and a minor fraction;

(B) introducing the major fraction into the high pressure column;

(C) dividing the minor fraction into the first stream and a second stream;

(D) cooling the first stream after expansion but before introduction to the low pressure column by indirect heat exchange with said second stream; and

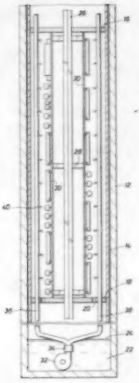
(E) introducing the second stream into the high pressure column.

4,407,136

DOWNHOLE TOOL COOLING SYSTEM

Scipio de Kanter, Missouri City, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 29, 1982, Ser. No. 363,327
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—64 **5 Claims**



1. A method of cooling electronic components in a downhole tool comprising the steps of:

(a) initially filling a sump within a downhole tool with liquid refrigerant;

(b) moving a portion of the refrigerant from the sump to be applied directly to the surfaces of electronic components in a chamber above the sump by vaporizing said refrigerant in said sump by contacting said liquid refrigerant in said sump directly with at least some of said electronic components;

(c) constraining the flow of vapor from the liquid refrigerant vaporized by absorbing heat from said electronic components, and directing the vapor against a cooling surface means to be converted into droplets of condensed refrigerant; and

(d) flowing said condensed refrigerant droplets across said electronic components and vaporizing the liquid refrigerant to cool said components.

4,407,137

FAST DEFROST HEAT EXCHANGER

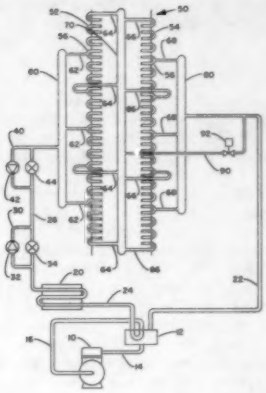
Richmond S. Hayes, Jr., Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,412
Int. Cl.³ F25D *21/00*
U.S. Cl. 62—80 **11 Claims**

9. A method of controlling the routing of refrigerant through a multi-row heat exchanger to allow for effective heat transfer and to promote rapid defrosting wherein the heat exchanger has multiple coil rows, a first header connected to a first coil row, a second header connected to a second coil row and an intermediate header for connecting the first coil row to the second coil row and wherein frost accumulates primarily on the first coil row which comprises the steps of:

routing the refrigerant between the first and second headers by directing flow through the coil rows and the intermediate header to have effective heat transfer between refrigerant flowing through the heat exchanger and air flowing thereover; and

circuiting refrigerant directly to the intermediate header from which it flows through the first coil row to the first



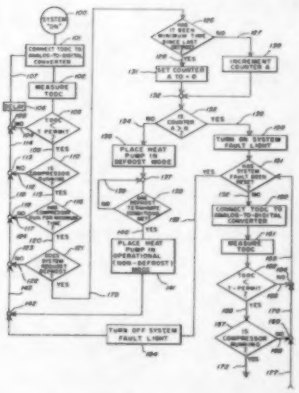
header to promote rapid melting of frost accumulated on the first coil row during defrost.

4,407,138

HEAT PUMP SYSTEM DEFROST CONTROL SYSTEM WITH OVERRIDE

Dale A. Mueller, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1981, Ser. No. 278,944
Int. Cl.³ F25D *21/02, 21/06*
U.S. Cl. 62—126 **20 Claims**



1. An outdoor coil defrost control system (hereinafter "defrost control system") for a reverse cycle refrigeration system (hereinafter "system") for heating and cooling a building wherein said system comprises refrigerant compression means, an indoor coil, an outdoor coil, and refrigerant conduit means connecting said compression means and said coils, said defrost control system comprising:

outdoor air temperature sensing means (hereinafter "TODAS") having an output indicative of outdoor air temperature (hereinafter "TODA");

outdoor coil temperature sensing means (hereinafter "TODCS") having an output indicative of the temperature of said outdoor coil (hereinafter "TODC");

enclosure temperature sensing means (hereinafter "STAT")

having an output indicative of a demand for heating or cooling of the enclosure;

means (hereinafter "COM") operatively associated with said compression means and adapted to have an output indicative of the operation of said compression means; and

controller means including counting means and timing means and having operative connections to said TODA, TODC, STAT and COM so as to receive the outputs thereof, said controller being effective to place said system into an initial outdoor coil defrost mode of operation when all of the following four events have occurred:

(a) TODC is less than T_{PERMIT}, where T_{PERMIT} is a preselected value,

(b) COM output indicates operation of said compression means,

(c) COM output indicates said compression means has operated for a preselected minimum time, and

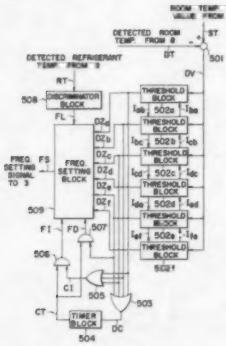
(d) TODC is less than TODA by a preselected constant;

thereafter said controller being effective to place said system into a non-defrost mode of operation when defrost terminate conditions have occurred; and thereafter said controller being effective to prevent the initiation of an outdoor coil defrost mode of operation whenever said controller has determined that said system has been placed into the defrost mode of operation more than a predetermined number of consecutive defrost intervals is less than a predetermined minimum time have occurred.

4,407,139
METHOD FOR CONTROLLING AN AIR CONDITIONING SYSTEM

Yuuichi Ide, and Harunobu Nukushina, both of Fuji, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 7, 1981, Ser. No. 309,413
Claims priority, application Japan, Oct. 13, 1980, 55-142769
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—215 **6 Claims**



1. A method for controlling an air conditioning system including a frequency-variable power source device for providing an AC electric power of a variable frequency, and a compressor driven by said AC electric power, the air conditioning power of said conditioning system being dependent on the frequency of said AC electric power, said method comprising the steps of:

detecting the temperature of the air to be conditioned,

providing a set value for the air temperature,

determining a deviation for the detected temperature with reference to the set temperature,

determining a frequency set value in accordance with said deviation, and

providing a frequency setting signal indicative of said frequency set value used to determine the frequency of said AC electric power,

said step of determining the frequency set value comprising:

defining, in advance, a plurality of temperature deviation zones, each zone being defined by upper and lower threshold values,

determining, by comparing said deviation with said upper and lower threshold values, the zone in which said deviation is in,

determining an initial frequency set value in accordance with said deviation,

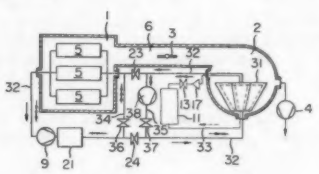
changing the frequency set value when said deviation transits from one of the zones to another, and

changing the frequency set value when said deviation continues to be within one of the zones corresponding to a relatively great deviation over a predetermined length of time.

4,407,140
VACUUM APPARATUS

Masakazu Kobayashi, Tokyo, Japan, assignor to Kyowa Vacuum Engineering, Ltd., Tokyo, Japan

Continuation of Ser. No. 164,031, Jun. 30, 1980, Pat. No. 4,353,222. This application Jul. 29, 1982, Ser. No. 403,163
Claims priority, application Japan, Jul. 4, 1979, 54-85262; Feb. 23, 1980, 55-21871
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—268 **3 Claims**



1. A freeze drying apparatus comprising:

(a) a closed-type vacuum chamber with a first vacuum chamber and a second vacuum chamber defined therewithin, a valve being disposed between said first vacuum chamber and said second vacuum chamber, a vacuum pump being operatively connected to said second vacuum chamber;

(b) a shelf means received within said first vacuum chamber for cooling or heating objects-to-be-freeze dried carried thereon and including brine flow means;

(c) a condensing means received within said second vacuum chamber and including refrigerant flow means and brine flow means therewithin, the outer surface of said condensing means in all or in part forming a vapor condensing surface;

(d) a brine pipe line for recycling brine between said shelf means and said condensing means;

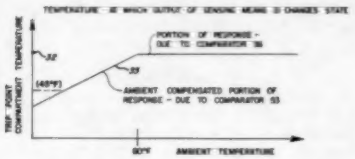
(e) a refrigerant pipe line for recycling refrigerant between said condensing means and a refrigerator installed outside of the closed-type vacuum chamber; and

(f) brine pump operatively connected to said brine pipe line for moving brine therethrough.

4,407,141
TEMPERATURE SENSING MEANS FOR REFRIGERATOR

Stephen W. Paddock, Knight Township, Vanderburg County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 4, 1982, Ser. No. 336,771
Int. Cl.³ G01K *13/00*; G05D *23/00*; G08B *17/00*
U.S. Cl. 62—130 21 Claims


TEMPERATURE AT WHICH OUTPUT OF SENSING MEANS IS CHANGES STATE
TRIP POINT COMPARTMENT TEMPERATURE
PORTION OF RESPONSE - DUE TO COMPARATOR 55
32
33
[48°F]
AMBIENT COMPENSATED PORTION OF RESPONSE - DUE TO COMPARATOR 53
80°F
AMBIENT TEMPERATURE

1. In a refrigeration apparatus having a cabinet defining a refrigerated compartment and an access opening to said compartment, a door selectively closing said access opening, and means for refrigerating said compartment, the improvement comprising:

a first temperature sensor carried by said door for sensing the temperature within the refrigerated compartment;

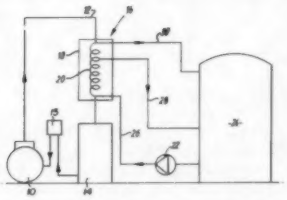
a second temperature sensor carried by said door and arranged to be primarily responsive to the ambient temperature exteriorly of said refrigeration apparatus adjacent said door; and

over-temperature indicator circuit means for providing an ambient-compensated signal of the temperature condition within said compartment in accordance with the sensed temperature of said first and second temperature sensors jointly.

4,407,142
HEAT RECOVERY

Kevin G. O'Reilly, Hyde, England, assignor to Hall & Kay Engineering Limited, Hyde, England

Filed Sep. 22, 1981, Ser. No. 304,460
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 10 Claims



1. A heat recovery system for a refrigeration plant, a heat engine, or like apparatus, such apparatus having a compressor for moving a superheated refrigerant to and through a condenser, the heat recovery system comprising:

a heat exchanger means operatively arranged between the compressor and the condenser, so that the refrigerant flows through the heat exchanger means,

two heating loads, one of the loads being at a higher temperature than the other,

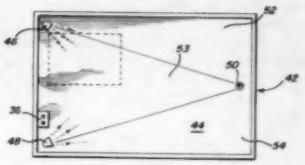
means for circulating a fluid heat transfer medium between the higher temperature load and a first part of the heat exchanger means for transfering superheat from the refrigerant to the higher temperature load, and

additional means for circulating a fluid heat transfer medium between the lower temperature load and a second part of the heat exchanger means for transferring latent heat from the refrigerant to the lower temperature load.

4,407,143
FROSTED CONDIMENT HOLDER

John J. Wolfe, P.O. Box 497, Savannah, Tenn. 38372

Filed Apr. 22, 1981, Ser. No. 256,593
Int. Cl.³ F28G *9/00*
U.S. Cl. 62—303 9 Claims

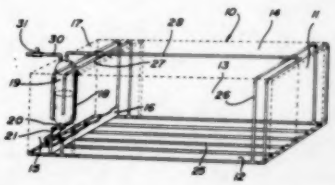


1. A condiment holder comprising a top plate containing at least one opening therein, a condiment container inserted into said opening, a refrigerant path placed adjacent said top plate and in heat exchange communication therewith so as to cool said top plate and form a layer of frost thereon, means positioned below said top plate and forming an enclosure for the space below the plate whereby the refrigerant path cools the enclosed space and the portion of the container therein, means for collecting condensate from said frost layer formed on said top plate, said collecting means including a fluid discharge means for directing fluid on said collecting means to clean said collecting means from contaminants formed thereon, said collecting means including a drain means to remove said condensate and discharged fluid from said condiment holder.

4,407,144
STORAGE CHAMBER WITH EXPENDABLE REFRIGERATION SYSTEM

David Garside, Quebec, Canada, assignor to Concool International Ltd., Georgetown, Cayman Islands

Filed Nov. 25, 1981, Ser. No. 324,987
Claims priority, application United Kingdom, Nov. 28, 1980, 8038314
Int. Cl.³ F25D *3/12*
U.S. Cl. 62—384 14 Claims



1. In a refrigerated storage container including: an insulated storage chamber having four walls, at least one of which has at least one access door therein, a floor and a roof; a pressurized liquid carbon dioxide reservoir in a direct heat exchange relationship with the interior of the chamber, the reservoir including an upper gaseous space and a vent from the gaseous space having a pressure relief valve therein adapted to maintain a substantially constant pressure in the reservoir such that the temperature of the liquid carbon dioxide in the reservoir is controlled;

the improvement wherein the liquid carbon dioxide reservoir comprises a network of linked liquid containing units

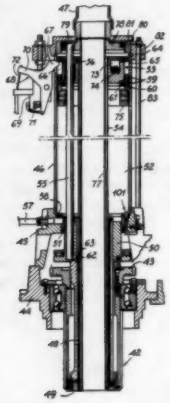
including horizontal units in the floor of the chamber being filled with liquid carbon dioxide and connected to at least one vertical riser unit in at least one wall of the chamber, the vertical riser unit being at least partially filled with liquid carbon dioxide and being connected to vent heat generated carbon dioxide gases via the pressure relief valve.

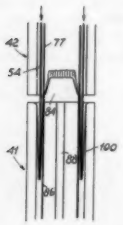
4,407,145

KNITWORK DRAWING DEVICE IN A DOUBLE CYLINDER CIRCULAR KNITTING MACHINE

Francesco Lonati, Brescia, Italy, assignor to Lonati S.p.A., Brescia, Italy

Filed Jul. 10, 1978, Ser. No. 923,416
Claims priority, application Italy, Jul. 14, 1977, 25773 A/77; Mar. 24, 1978, 21614 A/78
Int. Cl.[3] D04B 9/10, 15/88, 15/92
U.S. Cl. 66—14 6 Claims





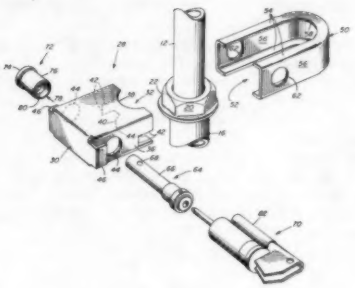
1. In a circular knitting machine having an upper and a lower needle cylinder defining a stitch-formation area therebetween, and needles in said upper and lower needle cylinder, a knitwork drawing device comprising a cylindrical chamber coaxial with said upper and lower needle cylinder, a fluid-operated piston slidable within said cylindrical chamber, a hollow rod secured to said piston and extending at least partially within one of said needle cylinders, said rod having open ends, knitwork retaining means arranged at said stitch-formation area, said knitwork retaining means having a cross dimension smaller than said hollow piston rod and being rotatable with the knitwork, means for delivering pressure fluid into said cylindrical chamber to operate said piston and for discharging pressure fluid therefrom, wherein said knitwork retaining means comprise a tubular member arranged inside said hollow rod and spaced therefrom and a locking member coaxial with said hollow rod and said tubular member, one of said members being axially movable with respect to the other to lock the knitwork therebetween, and wherein said hollow rod is movable past said stitch-formation area to engage and tension the knitwork which is being knitted by said needles and locked by said locking member and said tubular member, and further comprising a fixed tube coaxial with said upper and lower needle cylinder and defining said cylindrical chamber, a suction duct communicating with the interior of said tubular member at a position away from said stitch-formation area, at least one guide rod for said piston arranged within said tube and extending through said piston at an offcentered position, said guide rod being rotatable with said needle cylinders.

4,407,146

GAS METER LOCK ASSEMBLY

Anker J. Nielsen, Jr., Holden, Mass., assignor to Omco, Inc., Holden, Mass.

Continuation of Ser. No. 98,553, Nov. 29, 1979, abandoned. This application Aug. 4, 1981, Ser. No. 290,079
Int. Cl.[3] F16B 41/00; F16L 55/00
U.S. Cl. 70—232 10 Claims



7. In a reusable lock assembly adapted to prevent unauthorized disconnection of a gas line where the gas line is threadably connected to a gas meter, the gas line being conventionally connected by an internally threaded connection nut revolvably retained on the gas line, the connection nut being threadably engaged to an externally threaded gas meter inlet pipe, the lock assembly further including (a) a hollow male shroud having surfaces forming an open end and a closed end, the open end surfaces shaped to fit around and enclose approximately one-half of the internally threaded connection nut, the male shroud having two aligned transverse bolt lock holes formed therein adjacent to and substantially parallel to the closed end, (b) a hollow female shroud having surfaces forming an open end and a closed end, the open end surfaces shaped to fit around and enclose approximatey one-half of the internally threaded connection nut, the female shroud having two aligned transverse bolt lock holes formed therein adjacent to and substantially parallel to the open end, the female shroud being sized and shaped to telescopically assembled over the male shroud and to be non-destructibly disassembled from said male shroud, the connection nut being substantially entirely enclosed by the assembled male and female shrouds, the four bolt lock holes being aligned when the shrouds are telescopically assembled, (c) an end cap positioned in an adjacent pair of the bolt lock holes, the end cap opening within the telescoped shrouds and having an internal annular locking ball retaining groove, and (d) a bolt type lock positioned in the other adjacent pair of the bolt lock holes, the bolt type lock having locking balls which are adapted to be extended into the end cap retaining groove to become locked therein, the improvement therein comprising:

the male shroud having a pair of ears extending from the extreme edges of its closed end, said ears extending out

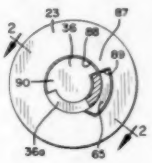
and away from each other and then back towards the bolt lock holes, said ears having leading edges, one of which is disposed closely adjacent to the bolt type lock, and the other one of which is disposed closely adjacent to the end cap, said female shroud and said male shroud being telescopically assembled in locked engagement when said bolt type lock and end cap are received in said bolt lock holes and said bolt type lock is locked to said end cap, said female shroud and said male shroud being non-destructibly separable from one another when said bolt type lock and said end cap are unlocked from each other and are withdrawn from said bolt lock holes.

4,407,147

PERIPHERAL KEY TUMBLER LOCK

Wayne F. Larson, Salem, Oreg., assignor to Supra Products, Inc., Salem, Oreg.

Filed Dec. 22, 1980, Ser. No. 218,720
Int. Cl.³ E05B *29/02*
U.S. Cl. 70—365 **14 Claims**



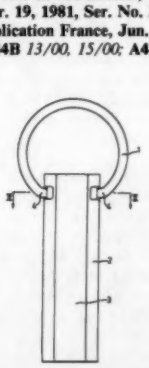
1. A lock comprising:
a stationary cylinder,
plural first rotary discs in said cylinder having their peripheries immediately adjacent the interior surface of said cylinder,
plural second rotary discs in said cylinder for actuating a locking member and having their peripheries immediately adjacent the interior surface of said cylinder,
a latching means latching said second discs, but not said first discs, against movement,
said first discs normally retaining said latching means in latching condition, but operable when moved to predetermined positions to enable said latching means to unlatch.

4,407,148

KEY HOLDER

Jean P. Rousseau, 98 Rue de Miromesnil, 75008 Paris, France

Filed Mar. 19, 1981, Ser. No. 245,416
Claims priority, application France, Jun. 27, 1980, 80 14464
Int. Cl.³ A44B *13/00, 15/00;* A47G *29/10*
U.S. Cl. 70—456 R **7 Claims**



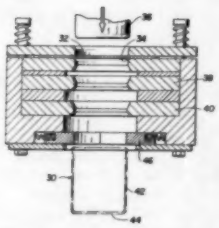
1. A key holder which comprises a rigid gapped ring having a gap which is defined between two mutually facing tips, a thin-walled metal sheath provided near one end with two transverse apertures of asymmetric form which permits the transverse introduction of the tips into the apertures from one side only of the sheath so that the sheath then bridges the gap, and a slide which is longitudinally slidable in the sheath and comprises two locking ribs, the slide being slidable in the sheath between an opening position, in which the ribs are clear of the apertures to permit the tips to be introduced into and removed from the apertures to allow keys to be fitted on to and removed from the ring, and a closing position in which the ribs are situated at the side of the apertures through which the tips are introduced and removed and partially mask the apertures to prevent the tips from being removed from the apertures so that the ring is closed by the sheath and any keys fitted to the ring are kept on the ring.

4,407,149

PROCESS FOR FORMING A DRAWN AND IRONED CONTAINER

John R. Smith, Richmond, Ohio; William D. Bingle, Rochester, Pa., and Lowell W. Austin, Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 233,569, Feb. 11, 1981, Pat. No. 4,374,902.
This application Sep. 30, 1982, Ser. No. 430,959
Int. Cl.³ B21D *22/28*
U.S. Cl. 72—47 **8 Claims**



1. A process for forming a drawn and ironed container from flat sheet steel comprising,
electroplating a nickel-zinc alloy coating of substantially uniform thickness to both sides of a sheet or strip of flat rolled steel of a gauge suitable for drawing and ironing, wherein the thickness of the nickel-zinc alloy coating on both sides of the base metal is within the range of about 0.5 to about 5.0 microinches, said coating containing zinc in the amount of about 2 to 12 percent by weight with the remainder being nickel and impurities,
drawing the nickel-zinc coated steel into a cup having sidewall and bottom wall thicknesses substantially equal to the thickness of the coated steel, and
ironing the sidewalls of the drawn cup to reduce the sidewall thickness and increase the height to produce a drawn and ironed can body.

4,407,150

APPARATUS FOR SUPPLYING AND CONTROLLING HYDRAULIC SWAGING PRESSURE

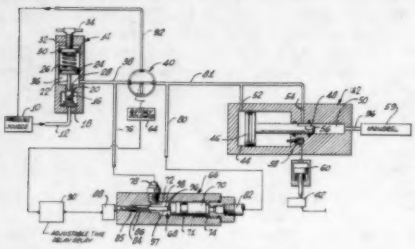
John W. Kelly, Burbank, Calif., assignor to Haskel Engineering & Supply Company, Burbank, Calif.

Filed Jun. 8, 1981, Ser. No. 271,373
Int. Cl.³ B21D *22/10*
U.S. Cl. 72—61 **21 Claims**

1. In an apparatus for forming leak-proof joints between tubes and a tube sheet by the internal application of hydraulic swaging pressure through a mandrel inserted within said tubes, a mechanism for supplying and controlling the swaging pressure comprising:
pressure source means for pressuring a fluid;

pressure reduction valve means arranged to receive pressurized fluid from said pressure source means for reducing the pressure of said fluid to a selected level;

control valve means connected to said reduction valve means for selectively permitting or interrupting the flow of said fluid from said reduction valve means to said mandrel;



pressurization sensor means connected to the input and output sides of said control valve means and responsive to the pressures of said input and output sides for generating a control signal when a predetermined comparative relationship exists between said pressures; and

actuator means for causing said control valve means to interrupt said flow in response to said control signal.

4,407,151

ROLLING MILL

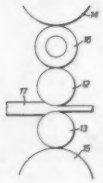
Robert W. Gronbech, Sheffield, England, assignor to Davey-Loewy Limited, Yorkshire, England

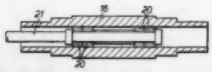
Filed Jul. 13, 1981, Ser. No. 282,717

Claims priority, application United Kingdom, Jul. 17, 1980, 8023335; Sep. 23, 1980, 8030666

Int. Cl.³ B21B *29/00*

U.S. Cl. 72—241 **7 Claims**





1. In a rolling mill for rolling elongate material, which mill has at least four rolls including two work rolls and a back-up roll for each said work roll, and in which one of said rolls of said mill has axially adjustable stiffness,

the improvement in which said one roll is hollow with an axial bore therein, and in which said bore contains a plurality of support discs, each of which is a close fit within said bore and each of which is axially adjustable within said bore.

4,407,152

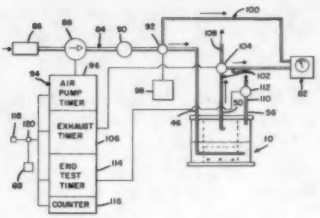
BREATH TEST SIMULATOR AND METHOD

Richard U. Guth, 439 N. 46th St., Harrisburg, Pa. 17111

Filed Oct. 19, 1981, Ser. No. 312,766

Int. Cl.³ G01N *31/00*

U.S. Cl. 73—1 G **31 Claims**



1. A breath test simulator including a first closed chamber, a second closed chamber surrounded by the first chamber with a common wall between the chambers, a series of diffusion holes extending through the wall to communicate the chambers and extending around the common wall at a level, a bubble generator in the first chamber surrounding the common wall at a level below the level of the diffusion holes, an outlet pipe opening into the top of the second chamber, a liquid temperature sensor in the second chamber, at least one liquid heater in each chamber, said sensor and heaters being located below the level of the diffusion holes, a temperature control for supplying energy to the heaters when the temperature sensed by the sensor is below a set point temperature, and means for moving liquid in the chambers to reduce temperature anomalies, whereby upon filling of the chambers with an ethyl alcohol solution to a level normally above the level of the dispersion holes, gas flowed through the bubble generator bubbles up through the liquid in the first chamber, collects in the top of the first chamber to eject liquid from the first chamber into the second chamber and increase the bubble column of liquid in a second chamber above the level of dispersion holes and to eject head space gases from the second chamber, sputters through the dispersion holes into the second chamber and bubbles up through the bubble column in the second chamber, so as to be brought into equilibrium with the liquid in the second chamber and assure the formation of an equilibrium concentration of ethyl alcohol vapor within the gas, and is flowed from the simulator through the outlet pipe.

21. In a simulator having two closed chambers and liquid in the chambers, the method of generating an effluent having a vapor in equilibrium with the liquid comprising the steps of:

A. Controlling the temperature of the liquid in the chambers;

B. Bubbling gas up through the liquid in a first chamber;

C. Sputtering such gas from the first chamber through dispersion holes and into the liquid in the second chamber;

D. Bubbling the gas in such second chamber up through the liquid in such chamber;

E. Collecting the gas at the top of such second chamber; and

F. During said bubbling and sputtering steps forming a vapor in such gas to bring such gas at the top of the second chamber in eqilibrium with the liquid in the second chamber.

4,407,153

FLUERIC PARTIAL PRESSURE SENSORS

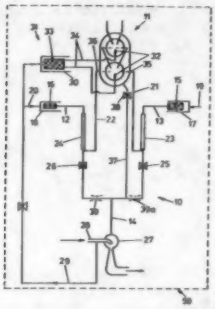
Owen D. Furlong, East Coker, and Leonard Moore, Somerton, both of England, assignors to Normalair-Garrett (Holdings) Limited, Yeovil, England

Filed Mar. 13, 1981, Ser. No. 243,499

Claims priority, application United Kingdom, Mar. 17, 1980, 8008917

Int. Cl.³ G01N 7/00

U.S. Cl. 73—23 7 Claims



1. A flueric partial pressure sensor including a flueric bridge having two legs, one of said legs sensing a reference gas and the other of said legs sensing a sample gas, means in said legs to provide an asymmetric flow rate through said legs to provide a constant pressure output signal for a predetermined constant partial pressure value of one of the gases in the sample gas mixture at varying absolute pressure.

4,407,154

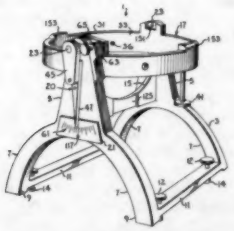
BOWLING BALL WEIGHING AND BALANCING DEVICE

Charles A. Hardman, 3326 W. 8th St., and Orville M. Burns, Jr., R.R. 4, both of Lawrence, Kans. 66044

Filed Sep. 14, 1981, Ser. No. 301,478

Int. Cl.³ G01M 1/04, 1/12

U.S. Cl. 73—66 11 Claims



1. A method for determining a degree of weight imbalance of a spherical object between each of three sets of hemispheres of the object which are those heimspheres which are opposed to each of three orthogonal planes which intersect at a geometric center of the object, the method comprising the steps of:

(a) positioning the object into a cradle which is freely and pivotally held between two opposed standards for free rotation over a continuous range of positions about an axis of rotation therebetween with a first rotated position being that position where a center of gravity of said cradle lies in a vertical plane which includes the axis of rotation thereof, said cradle having an indicator thereon which registers with a field positioned on said standard to determine the degree of rotation of said cradle relative to said standard;

(b) rotating the object within said cradle such that said vertical plane is coincident with one of said orthogonal planes when said cradle is in said first position thereof; said one of said orthogonal planes becoming a comparison plane;

(c) allowing said cradle to freely rotate relative to said stand;

(d) measuring the degree of rotation of said cradle relative to said stand;

(e) comparing the measured degree of rotation with a predetermined schedule to ascertain the weight imbalance between the two halves opposed to the comparison plane; and

(f) repeating steps (b) through (e) for each of the other two orthogonal planes.

4,407,155

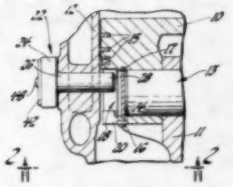
ENGINE OPERATION RELATED EVENT TIMING SYSTEM

Arthur R. Sundeen, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1981, Ser. No. 312,004

Int. Cl.³ G01M 15/00

U.S. Cl. 73—116 8 Claims



1. In an internal combustion engine, apparatus for timing the occurrence of an engine operation related event in respect to the top or bottom dead center position of the piston, comprising:

means for defining a pair of time intervals extending between the occurrence of the engine operation related event and the passage of the piston through a reference position before the event as the piston moves toward the dead center position and after the event as the piston moves away from the dead center position, respectively; and

means for utilizing the difference in duration between the pair of time intervals as an indication of the time relationship between the occurrence of the engine operation related event and the arrival of the piston at the dead center position, the sense of the difference indicating whether the event occurred before or after the arrival of the piston at the dead center position and the magnitude of the difference indicating the time difference between the occurrence of the event and the arrival of the piston at the dead center position.

4,407,156

AIR FLOW RATE MEASURING DEVICE IN AN INTERNAL COMBUSTION ENGINE

Michael Horbelt, Schwieberdingen; Herbert Arnold, Eberdingen, and Lothar Winkelmann, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 3, 1981, Ser. No. 270,271

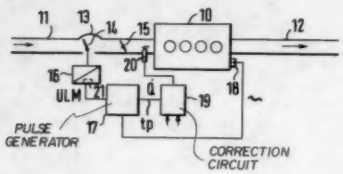
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021117

Int. Cl.³ G01M 15/00

U.S. Cl. 73—118 4 Claims

1. An air flow rate measuring device for an internal combus-

tion engine having an air intake tube, said air intake tube provided with a baffle valve, said baffle valve connected to a signal generating circuit, a damping means associated with said



signal generating circuit comprising at least one series circuit provided with a resistor, a capacitor and a junction point therebetween, and said junction point being coupled via a diode having a reference potential.

4,407,157

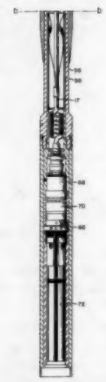
APPARATUS FOR MEASURING THE DIAMETER OF A BOREHOLE

Heinz D. Lichtenberg, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 5, 1981, Ser. No. 290,134

Int. Cl.³ E21B *49/00*

U.S. Cl. 73—151 **9 Claims**



1. A borehole caliper apparatus comprising:

an elongated body member adapted to traverse said borehole;

and electric coil assembly including first and second electric coils mounted within a section of said body member for simultaneously emitting an alternating magnetic flux field around each of said coils of said coil assembly;

a first collar member fixedly attached to said body member;

a second collar member longitudinally slidably mounted about said body member, said second collar member being constructed of highly conductive material and slidable within the magnetic flux field of one of said first and second electric coils;

a plurality of borehole-engaging members bridgingly supported between said frist and second collar members; and

circuit means for generating an electrical signal functionally related to the eddy current loading on said one coil in response to the movement of said second collar member within said magnetic flux field of said one coil, said signal being representative of the diameter of said borehole.

4,407,158

FLOW ANALYZER

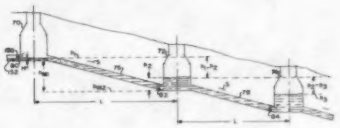
Peter D. Petroff, Condominium Park Blvd., 2305 Laurel St., Santurce, P.R. 00913

Division of Ser. No. 264,644, May 18, 1981, Pat. No. 4,344,329, which is a division of Ser. No. 104,540, Dec. 17, 1979, Pat. No. 4,295,197, which is a division of Ser. No. 905,196, May 12, 1978, Pat. No. 4,211,111, which is a division of Ser. No. 811,557, Jun. 30, 1977, Pat. No. 4,116,061, which is a division of Ser. No. 602,974, Aug. 8, 1975, Pat. No. 4,070,563. This application Aug. 13, 1982, Ser. No. 407,996

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.³ G01F *1/52*

U.S. Cl. 73—196 **6 Claims**



1. The method of identification of, and measurement of magnitude and location of, inflow and infiltration into a first sewer pipeline having an entrance end connected to, and receiving flow from, a first manhole, and said first sewer pipeline having an exit end connected to a second manhole, and wherein there is a second sewer pipeline having an exit pipe supplying flow to said first manhole comprising:

(A) placing liquid height measurement transducers into the exit end regions of sad first and second pipelines;

(B) responsive to a said transducer in the end region of a said second pipeline, making a series of spaced-in-time, time identifiable measurements of the magnitude of flow out of said second pipeline into said first manhole for a series of discrete times during an average dry, no rainfall, period of a day;

(C) responsive to a said transducer in the end region of said second pipeline, making a like time related series of flow measurements out of said second pipeline for a like period of a day during which rainfall occurs, including measurements from the time that a rainfall commences, and extending for a period beyond the end of the rainfall;

(D) responsive to a said transducer in the end region of said first pipeline, making a like timed and time identifiable series of magnitude of flow measurements out of said first pipeline into said second manhole for an average dry day;

(E) responsive to a said transducer in the end region of said first pipeline, making a like timed and time identifiable series of magnitude of flow measurements out of said first pipeline into said second manhole for the period of measurement defined in paragraph (C);

(F) combining the values of like timed flow measurements obtained as per paragraphs (B), (C), (D) and (E), wherein combined wet day flow measurement values bear opposite signs, combined dry day flow measurement values bear opposite signs, and the signs of wet and dry day measurements for one of said pipelines are of opposite signs, whereby a combination value for a rain period measurement is representative of "inflow" into said first sewer pipeline, and a combination value for a period following a rainfall is representative of "infiltration" into said first pipeline; and

(G) said liquid height transducer being positioned within the exit end region of each said pipeline at a point from the exit end of that pipeline equal to at least 0.8 times the interior diameter of a said pipeline, and the region between the point of measurement and exit end of the pipeline in which said height is being measured is unobstructed by a weir, and wherein each said liquid height measurement transducer comprises a pressure transducer provid-

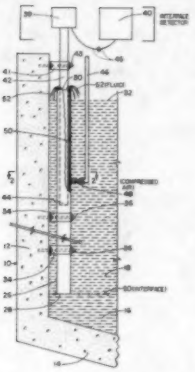
ing a signal output proportional to liquid height, and it is placed adjacent to the bottom of said exit end region of a said pipeline.

4,407,159

APPARATUS AND METHOD FOR DETECTING AN INTERFACE FROM A REMOTE LOCATION

Casimir S. Wytaniec, 3511 N. Lavergne, Chicago, Ill. 60641

Filed Jan. 19, 1981, Ser. No. 226,035
Int. Cl.³ G01F *23/22*; G05D *9/00*
U.S. Cl. 73—290 R **29 Claims**



1. A method for using a conventional interface detecting instrument having a detector portion with a tube having upper and lower openings to detect an interface between two fluids remote from the interface, comprising the steps of:

(a) locating the tube in the fluids,

(b) positioning one of the openings in the tube substantially at the interface,

(c) locating the detector portion in the tube between the upper and lower ends and remote from the interface, and

(d) introducing a drive fluid into the tube to cause at least one of the fluids to be drawn in from the opening substantially at the interface and flow from the interface, past the detector portion and out of the other opening of the tube, whereby the detector portion may make a reading of the fluid flowing past it, and the flow of fluid caused by the introduction of the drive fluid keeps the detector portion free of contaminants.

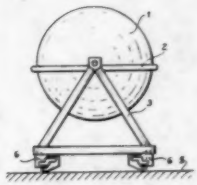
4,407,160

DEVICE FOR DETERMINING THE QUANTITY OF THE CONTENTS OF A TANK MOUNTED IN A FRAME WHICH RESTS ON A BASE WITH FOUR POINTS OF SUPPORT DISPOSED IN THE CORNERS OF A RECTANGLE

Reindert van de Velde, Breugel, Netherlands, assignor to Bavaria B.V., Lieshout, Netherlands

Filed Apr. 3, 1981, Ser. No. 250,668
Claims priority, application Netherlands, Apr. 3, 1980, 8001996
Int. Cl.³ G01F *23/20*; G01L *1/22*
U.S. Cl. 73—296 **3 Claims**

1. Device for determining the quantity of the contents of a tank mounted in a frame which rests on a base with four points of support disposed in the corner points of a rectangle, characterized in that two adjacent points of support of the tank frame are constituted by force measuring elements, each consisting of a generally block-shaped body of metal, in which an opening is cut out such that at the lower and upper side of the body two relatively thin elongated and substantially horizontally extending material portions are formed which are connected to each other at both ends by thicker material portions disposed at the vertical sides of the body, whereas at the lower side of the body a foot is formed which protrudes from one vertical side towards the vertical axis of the body, and with which the body rests on the base, and the supporting frame of the tank is affixed on the upper side of the body near its other vertical side and two strain gauges aligned in spaced apart relation with each other in the direction to the vertical axis of the body are ad-



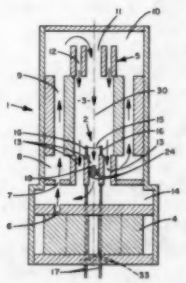
heared to one of the thin horizontal material portions so that by the deformation of said material portion as a result of the weight of the tank the one strain gauge is under strain of tension and the other under strain of longitudinal compression, the pairs of strain gauges of the two force measuring elements being connected in a resistor bridge to which a read out member is coupled by means to obtain a zero deflection and an end scale calibration of the read out member.

4,407,161

FLUID JET DISPLACEMENT DETECTOR

Carl M. Ferrar, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 11, 1982, Ser. No. 347,764
Int. Cl.³ G01P *15/08*
U.S. Cl. 73—505 **16 Claims**



1. An angular rate sensor comprising:

a housing;

means for forming a fluid jet having a flow path within the housing and having a substantially spatially symmetric fluid velocity profile;

a temperature sensitive element positioned in the housing in the path of the jet;

means for heating the temperature sensitive element to an operating temperature;

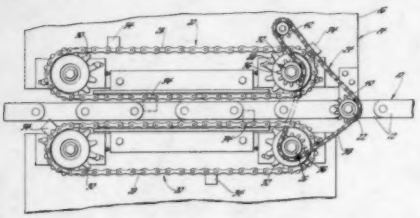
means for oscillating the temperature sensitive element through the path of the fluid jet in a plane generally perpendicular to the path of the jet; and

means for generating signals corresponding to temperature variations of the temperature sensitive element as the element traverses the flow path of the fluid jet.

4,407,162
CHAIN MOTION MEASURING DEVICE

Ulric Landenberger, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 15, 1982, Ser. No. 358,345
Int. Cl.³ G01P *3/00*
U.S. Cl. 73—527 **3 Claims**

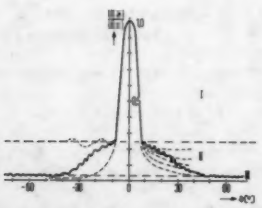


1. A chain motion measuring device for precisely measuring the actual speed and travel of a chain formed of interconnected links, said device comprising a pair of closed-loop primary drive means adapted to be engaged in staggered fashion and driven by the chain links whereby one of said primary drive means is always continuously fully engaged and driven by the chain without hesitation or jumping due to chain link pitch variation, measuring means for measuring speed and travel, closed-loop secondary drive means for uninterruptedly driving said measuring means, and separate overrunning drive means for separately drivingly connecting each of said primary drive means to said secondary drive means so that continuous drive is maintained from one of said primary drive means to said secondary drive means and thereby from the chain to said measuring means by operation of the overrunning drive means associated with said one primary drive means overrunning the other overrunning drive means when the other primary drive means becomes momentarily disengaged from the chain links because of chain link pitch variation whereby said measuring means is caused to give a true reading of actual chain speed and travel at all times regardless of chain link pitch variations.

4,407,163
METHOD FOR PROCESSING ULTRASONIC ECHO SIGNALS OF BOTH DIRECTIONALLY REFLECTING AS WELL AS NON-DIRECTIONALLY SCATTERING OBJECTS, PARTICULARLY FOR ULTRASONIC IMAGE PROCESSING IN THE FIELD OF SUBSTANCE OR TISSUE INVESTIGATION

Eckart Hundt, Haar, and Elmar Trautenberg, Fuerth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 15, 1981, Ser. No. 264,130
Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019436
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—607 **17 Claims**

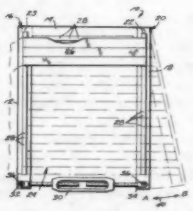


1. A method for processing ultrasonic echo signals of directionally reflecting as well as non-directionally scattering objects, particularly for ultrasonic image processing in the field of substance and tissue examination, said method comprising: combining ultrasonic echo signals from various scanning directions, and being characterized by the steps of evaluating the signals proceeding from directional reflection and from non-directional scattering of ultrasonic scanning pulses to produce respective preliminary images in accordance therewith, and producing a resultant image by coupling of the respective preliminary images, the evaluating step being characterized in that the maximum of the signal intensity is sought for each object point from the partial images gained from various scanning directions; in that, in that case in which a significant maximum is found for an object point, the image point representing said object point is further processed for producing a preliminary image as a signal generated by an echo signal of a reflecting object surface; and in that all remaining echo signals are processed for producing a preliminary image as signals generated by non-directionally scattering object areas.

4,407,164
IMPART MACHINE FOR DETERMINING HEAT SETTING CONDITIONS

Forbes Imlah, Clarksville, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 1, 1982, Ser. No. 394,438
Int. Cl.³ G01N *3/08, 33/36*
U.S. Cl. 73—831 **14 Claims**



1. A device adaptable for assisting in the prediction of the effects that selected treatments will have upon textile fabric comprising:

a frame defining an interior area;

means for securing a textile fabric to said frame across said interior area; and

impart means for angularly displacing at least a portion of said frame thereby varying the dimensional characteristic of said interior area.

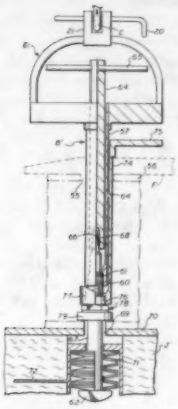
4,407,165
APPARATUS FOR ACCURATELY PRELOADING AUGER ATTACHMENT MEANS FOR FRANGIBLE PROTECTIVE MATERIAL

Alan M. Lovelace, Washington, D.C., and Kenneth E. Wood, Long Beach, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 30, 1981, Ser. No. 248,746
Int. Cl.³ G01L *5/00*
U.S. Cl. 73—862.54 **7 Claims**

1. Means for resiliently attaching, under accurate, predetermined preload, a first, surface-protecting part and a second part to be protected thereby comprising spring means attached to said first part, a screw extending from said spring means through said second part, a nut on said screw, and a preloading tool having a plurality of telescoped elements, a first of said telescoped elements having means engaging said screw to resist turning thereof, a second of said telescoped elements

having means applying a measured preload force to said screw and said spring means, and a third of said telescope elements



having means for screwing said nut against said second part to retain said preload force.

4,407,166

LONGITUDINALLY AND ANGULARLY ADJUSTABLE STEERING COLUMN

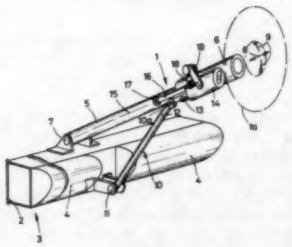
Dieter Protze, Wolfsburg, and Udo Voigt, Cremlingen, both of Fed. Rep. of Germany, assignors to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Apr. 7, 1981, Ser. No. 251,739

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016212

Int. Cl.³ B62D *1/18*; G05G *5/22*

U.S. Cl. 74—493 **4 Claims**



1. In a longitudinally and angularly adjustable vehicle steering column having an axis and including first and second steering column parts telescopically and relatively non-rotatably coupled to one another; said first steering column part being secured to a vehicle frame for swinging motion about a horizontally oriented axis; a steering wheel relatively non-rotatably mounted on said second steering column part; a steering column-supporting strut having first and second strut parts movable relative to one another; said first strut part being in engagement with said steering column and said second strut part being secured to said vehicle frame for swinging motion about a horizontally oriented axis; and tightening means for immobilizing said steering column in a set longitudinal and angular position thereof; the improvement wherein said first and second strut parts are bar-like components articulated to one another; said first strut part extending parallel to said axis of said steering column; a locking bar mounted on only one of the two said steering column parts and extending substantially parallel to said axis, said tightening means comprising a clamping sleeve mounted on the other of the two steering column parts; said first strut part and said locking bar projecting into said clamping sleeve and being slidable relative thereto in a released state of said tightening means; said tightening means further comprising means cooperating with said clamping sleeve for simultaneously immobilizing said locking bar and said first strut part in said clamping sleeve.

4,407,167

SLIDING GUIDE MECHANISM

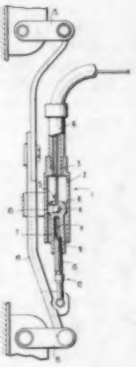
Heinz Koukal, Sindelfingen, and Hermann Grimm, Ostelsheim, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 12, 1980, Ser. No. 186,732

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936817

Int. Cl.³ F16C *1/14, 1/22*

U.S. Cl. 74—501 R **8 Claims**



1. A sliding guide mechanism which includes a flexible cable means for transmitting tensile and compressive forces, a sliding member having at least one end zone which is slidingly movably guided in a fixed guide sleeve, characterized in that at least the end zone of the sliding member has an approximately spherical shape, a bore means is provided in the end zone of the sliding member for enabling a suspension mounting of an end of the flexible cable means, and in that an axially extending bore means is provided in a remaining zone of the sliding member for enabling a coupling of the sliding member to an adjusting element for adjusting the slide guide means.

4,407,168

CRANK MECHANISM FOR SMALL, SINGLE-CYLINDER, RECIPROCATING ENGINES, PARTICULARLY REFRIGERATOR COMPRESSORS

Norbert Andrione, and Federigo Peruzzi, both of Turin, Italy, assignors to Aspera S.p.A., Castelnuovo Don Bosco, Italy

Filed Jun. 10, 1981, Ser. No. 272,237

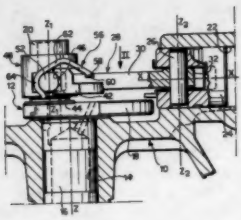
Claims priority, application Italy, Jun. 20, 1980, 67969 A/80

Int. Cl.³ G05G *1/00*

U.S. Cl. 74—579 E **3 Claims**

1. In crank mechanism for small, single-cylinder, reciprocating machines in which the crankshaft has a projecting crank pin coupled to an eye at the big-end of a connecting rod, an eye at the little end of the latter being coupled to a gudgeon pin connected to a piston, and in which the eye at the little-end is slidable axially of the gudgeon pin and is kept centred relative to the piston by resilient means, the improvement wherein the eye at the big-end of the connecting rod is defined by a bush

which is rotatably coupled to the crank pin and has a pair of diametrically-opposing pins, and wherein the end of the connecting rod associated with the big-end is fork-shaped, and the



arms of the fork are each articulated to one of the pins about a pivot axis perpendicular to both the axis of the crank pin and the longitudinal axis of the connecting rod.

4,407,169

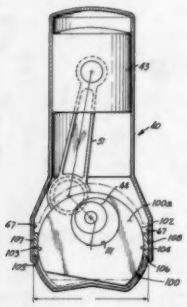
COUNTERWEIGHT SYSTEM FOR POSITIVE DISPLACEMENT PISTON TYPE DEVICE

Balan R. Menen, 529 N. Hart, Orange, Calif. 91101

Continuation of Ser. No. 98,702, Nov. 29, 1979, abandoned. This application Mar. 2, 1982, Ser. No. 354,068

Int. Cl.³ F16F *15/26*

U.S. Cl. 74—604 **9 Claims**



1. A counterweight system for a positive displacement piston type device, said device including a cylinder having an axis, a piston slidably mounted in said cylinder for axial reciprocation therein along said cylinder axis, a crankshaft having an axis of rotation normal to said cylinder axis, a crankthrow laterally spaced from said axis of rotation, and a connecting rod joined by bearings to said piston and crankthrow, said counterweight system comprising:

a slideway having a slideway axis normal to said crankshaft axis and parallel to said cylinder axis;

an eccentric journal on said crankshaft offset from said crankshaft axis so as to orbit around said crankshaft axis when the crankshaft is turned, said eccentric journal having a journal axis parallel to and spaced from the crankshaft axis;

a counterweight slidably mounted in said slideway for axial reciprocation therein along a path parallel to said cylinder axis;

bearing means on said counterweight having an established center of rotation relative to said counterweight, said bearing means being fully engaged to said eccentric journal whereby said journal rotates around said center of rotation of said bearing means;

said counterweight being free for wagging oscillatory arcuate motion laterally relative to said slideway axis in a plane normal to said journal axis, said counterweight having a center of gravity which is also the center of rotation of its wagging motion, said center of gravity being offset from said crankshaft axis, and from said center of rotation of said bearing means,

whereby reciprocation of said piston turns said crankshaft, which in turn causes said eccentric journal to orbit and cause said bearing means also to orbit, said slideway constraining translational movement of said counterweight to that which is parallel to said slideway axis, said center of gravity moving along a straight line parallel to said cylinder axis.

4,407,170

SPEED CHANGE DEVICE

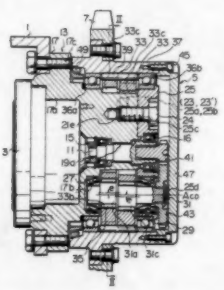
Kiyozumi Fukui, Gifu, Japan, assignor to Teijin Seiki Company, Limited, Osaka, Japan

Continuation of Ser. No. 116,750, Jan. 30, 1980, Pat. No. 4,348,918. This application May 20, 1982, Ser. No. 380,342

Claims priority, application Japan, Feb. 21, 1979, 54-19394; Aug. 31, 1979, 54-110236

Int. Cl.³ F16H *1/28*

U.S. Cl. 74—805 **9 Claims**



1. A speed change device which comprises:

an input shaft;

a plurality of rotatably mounted crankpins which are coupled to said input shaft so that the rotary movement of said input shaft is transmitted into a rotational movement of said crankpins;

an eccentrically revolving pinion which has a plurality of pin holes formed therein, and which are circumferentially spaced from each other, and outer gear teeth formed on a periphery thereof;

said crankpins being inserted into said pin holes so that the eccentric revolutional movement of said pinion is generated by means of said rotational movement of said crankpins; and

a hub surrounding said outer gear teeth of said pinion and having inner gear teeth which mesh with said outer gear teeth, said speed change gear being characterized in that:

said pinion having a plurality of through holes, each through hole being formed in a space between adjacent pin holes thereof;

a support block arranged to permit a relative rotation to occur between said hub and said support block, having a plurality of column portions formed thereon and loosely inserted into said through holes of said pinion, and wherein the opposite ends of said block rotatably support said crankpins;

said through holes in said pinion and said column portion of the said support block including a first portion extending circumferentially and a second portion extending radially and inwardly from said first portion; and

at least one bearing which is mounted between said support

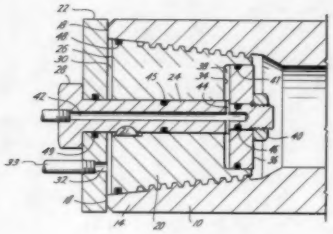
block and said hub so that the relative rotational movement of said support block and said hub is permitted.

4,407,171

APPARATUS AND METHOD FOR HYDROSTATICALLY TESTING SEALING FACE SURFACES OF TUBULAR JOINTS

Malvern M. Hasha, 11002 Twain Dr., Montgomery, Tex. 77356, and Brian B. Hasha, 17211 Ash Butte, Houston, Tex. 77090

Filed Jul. 10, 1981, Ser. No. 282,088
Int. Cl.³ G01M *3/08*
U.S. Cl. 73—46 **40 Claims**



1. An apparatus for testing a sealing face surface of a pipe comprising

means for engaging a test pad against said sealing face surface of said pipe; and

means for applying pressure to the juncture between said test pad and said sealing face surface to test said sealing face surface of said pipe for seal integrity against leakage, and

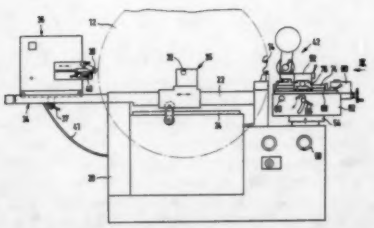
wherein the sealing face surface of the pipe, in the case of a male end of a threaded pipe, is the shoulder at the end of the threaded portion, and in the case of a female end of such threaded pipe, is the extreme end edge, and in the case of an unthreaded pipe, is the extreme end edge thereof.

4,407,172

METHOD FOR REPAIRING HARD ALLOY-TIPPED SAW BLADES

Ernst Beck, Maselheim, and Peter Lenard, Biberach an der Riss, both of Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Fed. Rep. of Germany

Division of Ser. No. 190,451, Sep. 24, 1980, Pat. No. 4,366,728. This application Jul. 8, 1982, Ser. No. 396,296
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1979, 2940730
Int. Cl.³ B23D *63/00*
U.S. Cl. 76—112 **1 Claim**



1. A method for repairing hard-alloy-tipped saw blades having hard-alloy-plates comprising the steps of:

(a) placing a saw blade on a blade support, said saw blade being turnable with respect to said blade support;

(b) turning said saw blade to a position where a selected plate is in working range of a brazing tool;

(c) brazing off said selected plate from its corresponding plate seat by using said brazing tool;

(d) reconditioning said plate seat without removing said saw blade from said blade support;

(e) brazing a new plate onto said plate seat by using said brazing tool;

(f) turning said saw blade to a position where said selected plate is in working range of a grinding tool; and

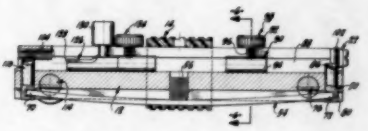
(g) grinding said new plate, said saw blade remaining on said blade support for the grinding thereof.

4,407,173

DEVICE FOR REMOVING INSULATION FROM AN INSULATED CONDUCTOR

Robert B. Hendry, Nevada City, Calif., assignor to Reon Manufacturing Company, Nevada City, Calif.

Filed May 11, 1981, Ser. No. 262,592
Int. Cl.³ H02G *1/12*
U.S. Cl. 81—9.5 R **8 Claims**



1. A device for removing insulation from an insulated conductor comprising:

a. cutting means intended for cutting the insulation, said cutting means being mounted on a structure base said cutting means including a first and second cutting blade mounted adjacent to one another on said structural base, said cutting base forming a space for confirming the insulated conductor such that the insulation of the insulated conductor may contact said cutting means while occupying said space;

b. a finger intended for exerting pressure on the insulation of the insulated conductor while being confined to said space adjacent said cutting means; said finger being mounted to said structural base;

c. means for moving said finger in relation to said cutting means, said means for moving said finger in relation to said cutting means including a resilient bar having a first end portion and a second end portion said bar being connected to said finger at said first end portion of said bar and being connected to said structural base at said second end portion thereof such that said first end portion of said bar and said finger are forced toward said first and second blades; and

d. means for moving said first end portion of said bar away from said first and second cutting blades.

4,407,174

TOOL FOR STRIPPING ELECTRICAL CONDUCTORS

Rainer Schulze, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed May 28, 1981, Ser. No. 267,987
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1980, 8015246[U]
Int. Cl.³ H02G *1/12*
U.S. Cl. 81—9.5 A **6 Claims**

1. A tool for stripping the sheathing from sheathed conductors, comprising

(a) a pair of articulated clamping jaws for holding an end of a sheathed conductor during stripping operations, a first

of said clamping jaws being provided on a main body to which the second of said clamping jaws is pivotably connected, said pivotable clamping jaw having a portion extending backwards from the pivot point and provided at its rear extremity with a cam surface;

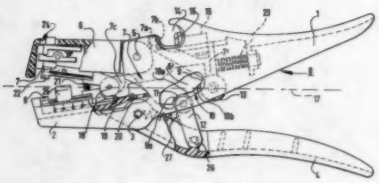
(b) a pair of longitudinally movable, articulated stripping jaws adjacent the inner sides of said clamping jaws, said stripping jaws having cutting edges for cutting into said sheathing and for stripping said sheathing from said conductors;

(c) pulling means on said main body connected to said stripping jaws for pulling said stripping jaws in a direction longitudinal to a conductor held in said clamping jaws;

(d) cutting means in said main body comprising a movable blade operable by said pulling means;

(e) a member pivotably connected by one end thereof to said main body and extending longitudinally backward away from said clamping jaws;

(f) a driving arm pivoted at one end thereof to said member, the free end of said driving arm engaging said cam surface on said pivotable clamping jaw; and



(g) a projecting member on said pulling means adjacent said cam surface, so located that when said main body and said pivoted member are urged together, the free end of said driving arm first moves along said cam surface to simultaneously close said articulated clamping jaws and said stripping jaws and then engages said projecting member on said pulling means to pull said cutting jaws in a longitudinal direction to strip said sheathing from the end of a conductor held by said clamping jaws and to move said movable blade;

(h) said cam surface comprising:

(i) a first cam surface portion arranged to be engaged by said driving arm during stripping of said sheathing, said first cam surface portion being at a relatively shallow angle to the longitudinal center axis of said tool; and

(ii) a second cam surface portion arranged to be engaged by said driving arm during cutting movement of said movable blade, said second cam surface portion being at a relatively steep angle to said longitudinal center axis and extending at an angle to the longitudinal axis of said driving arm in every position of said clamping jaws and said stripping jaws.

4,407,175

TOOL FOR ROTATING THREADED FASTENERS

Douglas I. Graham, 86 Yew Tree Dr., Guildford, Surrey, England GU1 1NZ

Filed Sep. 2, 1981, Ser. No. 298,909

Int. Cl.³ B25B *13/46*

U.S. Cl. 81—57.39 **6 Claims**

1. A wrench head for use with a rachet-wrench for rotating a fastener, said rachet-wrench including an elongated handle, a rachet mechanism attached to said handle and a key-like shaft depending from said rachet mechanism, said wrench head comprising:

(a) housing means;

(b) rotatable drum means located in said housing means;

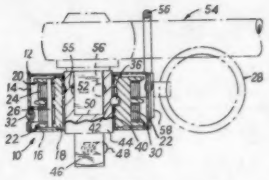
(c) a flexible member normally wound around said drum means and including a first end fixed to said drum means and a second end extending through an opening in said housing means, pulling of said second end causing rotation of said drum means;

(d) a resilient means connected between said drum means and said housing means to resiliently resist said pulling of said second end of said flexible member;

(e) said rotatable drum means including an opening formed therein;

(f) a stub shaft means removably placed in said drum means opening;

(g) means carried by said drum means for releasably retaining said stub shaft means in said drum means opening, said releasably retaining means also allowing rotation of said



drum means with respect to said stub shaft means in a first direction and preventing such rotation in a second direction;

(h) receptacle means formed in one end of said stub shaft means which releasably receives said key-like shaft of said rachet-wrench;

(i) key means depending from the other end of said stub shaft means which fixedly engages a receptacle formed in a standard socket member; and

(j) means on said housing means which releasably retains said elongated handle of said rachet-wrench in a fixed orientation with respect to said wrench head.

4,407,176

FEEDING DEVICE FOR BARSTOCK ON TURNING MACHINES AND THE LIKE

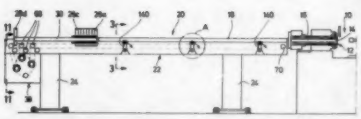
Helmut F. Link, Aichwald, Fed. Rep. of Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Jun. 26, 1981, Ser. No. 277,893

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024766

Int. Cl.³ B23B *13/00, 13/02, 13/04, 13/08*

U.S. Cl. 82—2.5 **14 Claims**



1. A feeding system for barstock on turning machines, said system having support means extending in the feeding direction, at least three holders for holding and slideably guiding a length of said barstock, said holders being carried by said support means for sliding movement in the feeding direction, and coupling means interconnecting the holders for moving the holders close together and apart, characterized in that said coupling means are in the form of guiding means (**122,126, 128, 130**) comprising rigid elements for maintaining said holders (***28a, 28b,* 28c**) parallel to each other and for synchronously driving the holders together and apart and maintaining equidistant interholder spacing.

4,407,177

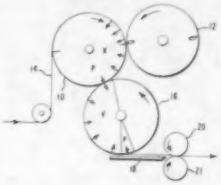
ON-LINE CORNER ROUNDER

Alfred J. Schmidt, Aston, Pa., and Michael H. Shearon, Cecil County, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 159,794, Jun. 16, 1980, abandoned. This application May 24, 1982, Ser. No. 381,216

Int. Cl.³ B26F *1/12*

U.S. Cl. 83—300 **9 Claims**



1. In an apparatus having a roll over which a web is advanced continuously as sheets are cut therefrom, the improvement comprising provision of

a transport roll located adjacent said cutting roll, said transport roll having a peripheral surface located to receive successive abutting cut sheets, and

a pair of spaced, cam-actuated, corner-rounding assemblies associated with said transport roll, there being an assembly at each side of the path of transport,

said transport roll being coupled to the cutting roll for rotation in synchronism therewith, each corner-rounding assembly including a die located beneath the level of said surface, a punch and means mounting the punch for reciprocation radially from a normal position in said die outwardly to a position beyond said level and back to the normal position, said die being fixed to said transport roll for rotation therewith,

said punch being positioned to spread abutting sheets at their edges during its outward movement, there being a radially disposed bar beneath the punch for positioning the sheets as corners are cut during movement of the punch back to its normal position.

4,407,178

CIRCULAR SAW BLADES

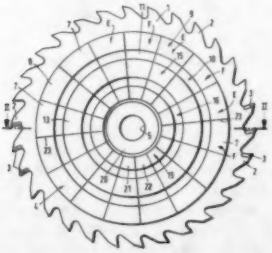
Josef Störzer, Horb-Nordstetten, Fed. Rep. of Germany, assignor to Ledermann GmbH & Co., Horb, Fed. Rep. of Germany

Continuation of Ser. No. 66,686, Aug. 15, 1979, abandoned. This application Sep. 23, 1981, Ser. No. 304,910

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835714

Int. Cl.³ B27B *33/08*

U.S. Cl. 83—835 **1 Claim**



1. A metal circular saw blade that assures wobble-free, clean cuts for sawing wood and cutting grooves into wood and material similar to wood, said saw blade having a cutting zone and a central mounting bore, wherein the improvement in combination therewith comprises:

an annular carrying zone extending substantially between said central mounting bore and said cutting zone, said carrying zone being comprised of a stiff annular disc of thin light metal of substantially uniform thickness defining first and second sides; the annular disc being divided into alternating wedge-shaped segments of a first and second type, each wedge-shaped segment being defined by an arc in the range of 15° to 30°;

wherein: the first type of segment is defined by a first pattern comprising first and second embossments; the first and second embossments alternating with one another in the radial direction; the first embossments being raised with respect to the second embossments when viewed from the first side of the carrying zone and being lower with respect to the second embossments when viewed from the second side of the carrying zone; the first embossments being substantially wider in a radial direction than the second embossments; and the first and second embossments being joined to one another by surfaces which slope obliquely with respect to the sides of the annular carrying zone;

wherein: the second type of segment is defined by a second pattern which is identical with, but reversed with respect to the first pattern, the second pattern comprising first and second embossments; the first and second embossments alternating with one another in the radial direction; the first embossments being raised with respect to the second embossments when viewed from the second side of the carrying zone and being lower with respect to the second embossments when viewed from the first side of the carrying zone; the first embossments being substantially wider in the radial direction than the second embossments, and the first and second embossments being joined to one another by surfaces which slope obliquely with respect to the sides of the annular carrying zone;

and wherein: the cutting edge includes radial notches, each of which has a cutting tooth therein which tooth has a width which extends the tooth beyond the embossments in a direction perpendicular to the first and second sides;

whereby, the resulting blade has an enhanced cutting capacity and enhanced cooling while being relatively stiff and stable when cutting due to the first and second embossments extending over the carrying zone.

4,407,179

PROCESS AND APPARATUS FOR CUTTING AN ELONGATE COMPLEX STRUCTURE

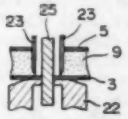
Katsuhiko Iwase, Kaminoyama, and Minoru Saito, Murayama, both of Japan, assignors to IG-Technical Research Inc., Higashine, Japan

Filed Sep. 10, 1981, Ser. No. 300,862

Claims priority, application Japan, Oct. 6, 1980, 55-139618; Oct. 15, 1980, 55-144165

Int. Cl.³ B26D *1/00, 3/00*

U.S. Cl. 83—865 **41 Claims**



1. A process for cutting a complex structure composed of a facing of hard material, a core of foamed material and a liner of flexible material, which comprises cutting the liner and the core by a pair of first upper cutters (**23**) arranged in parallel with each other in the direction of the width of the complex structure, then advancing a second upper cutter (**24**) between

the pair of the first cutters (23) to cut the facing, and retracting the first and second cutters (23) and (24) from the respective cutting positions.

4,407,180

AIRCRAFT LOAD LOCK, ESPECIALLY BOMB LOCK INCLUDING CENTRAL OPERATING MEANS

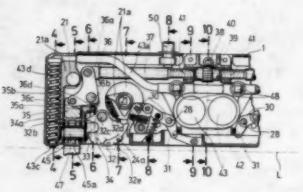
Karl Regnat, Siegertsbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,700

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019782

Int. Cl.³ F41F 5/02

U.S. Cl. 89—1.5 B 11 Claims



1. A load lock for attaching a load having load holding means (33) to an aircraft, comprising lock housing means (1) and operational components in said lock housing means, said operational components including load suspending means (32) operatively arranged in said locking housing means in a given plane for cooperation with said load holding means, first drive means (28, 30, 31) operatively arranged substantially in said given plane in said lock housing and connected to said load suspending means (32) for controlling said load suspending means (32) in its cooperation with said load holding means (33), load securing means (34, 35, 36, 45, 46) operatively arranged in said lock housing means (1) for clawing or clamping a load suspended from the lock by the load suspending means (32), second drive means (37, 38, 39, 40) operatively arranged substantially in said given plane in said lock housing means and connected to said load securing means (34, 36) for performing said clawing or clamping depending on the direction of operation of said second drive means, and fuzing means (24) including operating means (22, 29) for said fuzing means operatively arranged laterally in said housing and connectable to a load for arming or fuzing said load, whereby all of said operational components are constructed and arranged symmetrically relative to said given plane so that said load lock assures an external operability and serviceability on each side of the aircraft even if a load is held in the load lock, wherein said load securing means comprise journal means (47) operatively held in said lock housing means and claw means (45, 45a, 46) journalled to said journal means for holding a load in a steady position, and wherein said second drive means comprise worm gear means (38, 40), wedging means (35) operatively arranged to force said claw means into a load clawing position, and linkage means (36, 37) connecting said worm gear means to said wedging means for applying a wedging force to said wedging means in response to rotation of said worm gear means in one direction, whereby said linkage means operate to transmit pressure, said load lock further comprising spring means (44) operatively connected to said claw means for returning the claw means into a rest position when the wedging force is released.

4,407,181

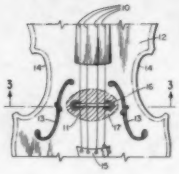
PROCESS FOR IMPROVING THE TONAL QUALITY OF STRINGED INSTRUMENTS

Thomas H. Thomas, R.F.D. #2 Box 19, Litchfield, Me. 04350

Filed Jan. 12, 1981, Ser. No. 224,114

Int. Cl.³ G10D 1/02, 3/02

U.S. Cl. 84—275 2 Claims



1. A process of improving the tonal quality of any commercially made completed stringed instrument, such as, a violin or cello with an adequately thick belly which comprises the steps of:

1. playing the instrument;
2. removing the bridge and strings of the instrument;
3. reducing the thickness of the belly directly under the feet of the bridge on the outer surface at the belly by a few thousandths of an inch;
4. putting the bridge back on the instrument and restringing, retuning, and replaying the instrument;
5. repeating steps 2–4 as many times as necessary until the tonal quality of the instrument is at its optimum; and
6. shaving down surrounding portions of the belly in such a manner as to preserve its smoothly convex, curved surface.

4,407,182

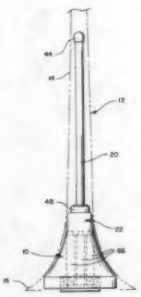
MUSICAL INSTRUMENT STAND

Americole R. Biasini, Bellingham, Wash., assignor to Allsop, Inc., Bellingham, Wash.

Filed Oct. 9, 1981, Ser. No. 310,036

Int. Cl.³ G10G 5/00

U.S. Cl. 84—453 18 Claims



1. A musical instrument support stand adapted for storage substantially entirely within the instrument during periods of non-use, comprising:

(a) base means for supporting a musical instrument stand;

(b) post means secured at a first end to said base means and having a free distal end for projection within the interior of a musical instrument, and,

(c) musical instrument support means received on said post and adjustable over the length thereof, having an outer geometry complementary to the interior geometry of said

musical instrument, for supporting receipt of said musical instrument thereon.

4,407,183

METHOD AND APPARATUS FOR HYDRAULICALLY CONTROLLING SUBSEA EQUIPMENT

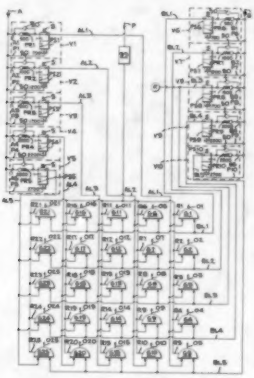
Lionel J. Milberger, Spring; Charles E. Horn, and Marvin H. Kluttz, both of Houston, all of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Jun. 29, 1979, Ser. No. 53,160

Claims priority, application United Kingdom, Sep. 27, 1978, 38283/78

Int. Cl.³ F01B *25/26*

U.S. Cl. 91—1 **15 Claims**



1. Apparatus for remote individual control of a relatively large number of hydraulically-actuated operators using a smaller number of hydraulic lines between a surface control center and a subsurface device containing said operators, said apparatus comprising:

means for connecting said apparatus to a source of hydraulic fluid pressure,

a plurality of hydraulic AND-gates each having an output and a pair of inputs, each of said AND-gates providing an output pressure only when a pressure in simultaneously applied to both of said inputs, said gates being arranged in a matrix of rows and columns;

first and second signal pressure lines;

control means for coupling predetermined values of fluid pressure from said fluid source to said first and said second signal lines;

means for applying signals from said first pressure line to a first input of each of the gates in a predetermined row when the pressure in said first pressure line is within a corresponding predetermined range;

means for applying signals from said second pressure line to a second input of each of the gates in a predetermined column when the pressure in said second line is within a corresponding predetermined range; and

means for coupling the output of each of said gates to a corresponding one of said operators so that only one of said operators is pressurized at a time.

4,407,184

PNEUMATIC SERVO BOOSTER

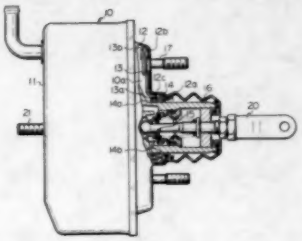
Hiromi Ando, Tokyo, and Kiyoshi Tateoka, Fujisawa, both of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Nov. 20, 1980, Ser. No. 209,214

Claims priority, application Japan, Nov. 26, 1979, 54-163425

Int. Cl.³ F15B *9/10*; F16J *15/18*

U.S. Cl. 91—376 R **1 Claim**



1. A pneumatic servo booster comprising:

a shell housing formed of front and rear shells;

a valve body incorporating therein a valve mechanism, said valve body sealingly extending through and being slidably supported by said rear shell;

a seal member positioned between said rear shell and said valve body, said seal member having therein an annular groove;

a reinforcing plate provided on the inner surface of said rear shell, said reinforcing plate comprising an annular member having an inner circumferential end snugly fitted within said annular groove in said seal member without being integrally attached thereto and acting to position said seal member; and

mounting bolts passing through said reinforcing plate and said rear shell for mounting the booster.

4,407,185

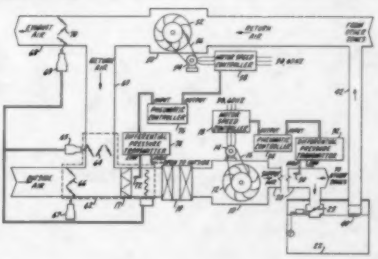
RETURN AIR FLOW CONTROL FOR VARIABLE AIR VOLUME SYSTEM

Roger W. Haines, Laguna Hills, Calif., and Mark A. Purinton, South Glens Falls, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 23, 1982, Ser. No. 351,634

Int. Cl.³ B64D *13/00*; F25B *29/00*

U.S. Cl. 98—1.5 **6 Claims**



1. A variable air volume conditioning system for maintaining the inflow of outside air above a predetermined rate regardless of the volume of the air being supplied to a conditioned space, said system comprising:

a. a duct system including a supply duct for delivering supply air to a conditioned space and a return duct for returning a portion of the air supplied to said conditioned space;

b. a plenum chamber in said duct system, said chamber

having an outside air inlet, a return air inlet, and an outlet communicating with said supply duct;

c. air conditioning means for attempering the stream of mixed outside air and return air downstream from said plenum chamber;

d. a supply air fan associated with said supply duct;

e. a return air fan associated with said return duct; and

f. means, interconnected between said plenum chamber and said return air fan, for sensing the static pressure in said plenum chamber and for controlling the speed of the return air fan so as to maintain the plenum chamber pressure at a substantially constant negative level relative to a fixed reference level.

4,407,186

FLOW OUTLET STRUCTURE FOR AUTOMOTIVE AIR CONDITIONER

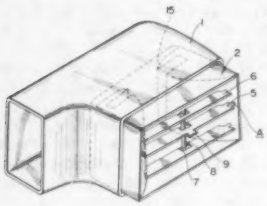
Masao Izumi; Hideki Maruyama, both of Fujisawa, and Hiroshi Yoshida, Zama, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Apr. 6, 1981, Ser. No. 250,939

Claims priority, application Japan, Apr. 7, 1980, 55-46769[U]

Int. Cl.³ B60H *1/00*

U.S. Cl. 98—2 **6 Claims**



1. A flow outlet structure for an automotive air conditioner, comprising:

a duct having one end communicable with said air conditioner to receive conditioned air therefrom, and an opposite end;

an air outlet coupled with the opposite end of said duct, said air outlet including a fluidic element means having a solenoid valve for urging the flow of conditioned air passing through said air outlet to deflect in a first direction when said solenoid valve is energized and in a second direction when said solenoid valve is not energized; and

a louver fitted in the outlet opening and having a plurality of parallel pivotable slats for swingable movement in a direction normal to said first and second directions, said plurality of slats being disposed at a downstream end of said air outlet with respect of the flow of conditioned air.

4,407,187

AIR CONTROL DEVICE

Robert W. Horney, 2402 Maple Rd., Corinth, Miss. 38834

Filed Dec. 15, 1981, Ser. No. 330,964

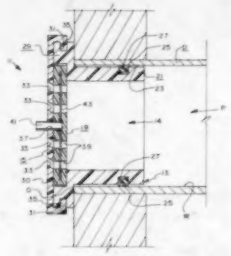
Int. Cl.³ F24F *13/12*

U.S. Cl. 98—41 SV **4 Claims**

1. An air control device for use in conjunction with the air passageway of an air flow duct to control the flow of air therethrough, said air control device comprising:

(a) a stationary plate means for being attached to said air flow duct transverse of said air passageway, said stationary plate means having a substantially flat face and a plurality of circular apertures therethrough, the longitudinal axes of said apertures being at an oblique angle with respect to said face; and

(b) a movable plate means for covering said plurality of apertures of said stationary plate means, said movable plate means having a substantially flat face and a plurality of circular apertures therethrough and being movable between a first position in which said plurality of apertures through said movable plate means are fully out-of-alignment with said plurality of apertures through said



stationary plate means and a second position in which said plurality of apertures through said movable plate means are fully aligned with said plurality of apertures through said stationary plate means, the longitudinal axes of said apertures being at a right angle with respect to said face.

4,407,188

SETTABLE SHUTTER DEVICE

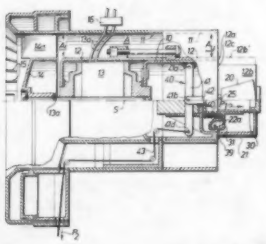
Olov Thörn, Torshälla, Sweden, assignor to Pax Electro Products AB, Hälleforsnäs, Sweden

Filed Apr. 13, 1981, Ser. No. 253,531

Claims priority, application Sweden, Apr. 11, 1980, 8002743

Int. Cl.³ F24F *7/013*

U.S. Cl. 98—116 **13 Claims**



1. A settable shutter device particularly for use with a ventilator comprising an annular channel defined by an outer casing and a concentric inner casing located about the axis of said ventilator, said ventilator comprising an apparatus body and means to mount said apparatus body within said inner casing, said shutter device comprising a plurality of shutter blades adapted to control air flow through said annular channel, each of said shutter blades having the shape of an annular segment defined by a pair of radial sides, a longer outer transverse edge and a shorter inner transverse edge, each of said shutter blades comprising an elongated extension extending generally radially from said inner edge and, when mounted, radially towards the ventilator axis, said extension having a transverse extent less than the transverse extent of said inner transverse edge, each of said shutter blade extensions having a portion bent out of planes radial to said ventilator axis, means to pivotally mount said blades each about its own axis closely spaced to the periphery of said inner casing, each said blade axis being generally tangential to said inner casing, respective opening means formed in said inner casing to permit said elongated blade extensions to pass therethrough to the inside of said inner casing, each of said blades comprising stabilizing means to

stabilize the position of each said blade in said opening means, driver means for controlling the motion of said blades and to determine any set position of said blades between two limit positions where said channel is completely open or completely closed, said driver means being located concentrically inside said inner casing, means to permit motion of said driver means axially of said ventilator axis, spring means normally urging said blades toward one of said limit positions, said driver means being formed with circumferentially arranged actuating means engaging the inner ends of all said blade extensions in all positions of said blades with respect to said channel and in all corresponding positions of driver means.

4,407,189

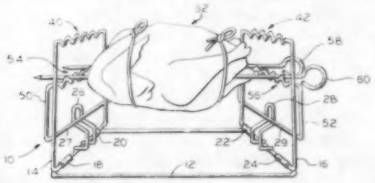
ROAST SPIT

Wade Bentson, San Francisco, Calif., assignor to AMCO Corporation, Chicago, Ill.

Filed Jul. 12, 1982, Ser. No. 397,547

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—421 HH **5 Claims**



2. A folding wire frame rack comprising a rectangular base having a main support panel connected by hinges to each of an opposed pair of ends, each of said main panels having a support edge opposite said hinges and formed of opposed peaks and valleys which cooperate to form a plurality of skewer support positions, a secondary panel welded to each of said main panels in positions which form support edges having opposed peaks and valleys along upper edges of said secondary panels, the support edges of said main panels and secondary panels being generally parallel, said secondary panels having lower edges which are displaced from the hinged locations where said main panels join the ends of said rectangular base, and latching means comprising upstanding locking supports welded to each of said ends in positions where the lower edges of said secondary panels snap into a locking position when said main panels are moved to an open position.

4,407,190

BALE DISCHARGE GATE LATCH ASSEMBLY FOR CYLINDRICAL BALER

Leo G. Cheatum, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 28, 1982, Ser. No. 382,884

Int. Cl.³ B30B *5/06*; A01D *43/02*; E05C *3/16*

U.S. Cl. 100—88 **2 Claims**

1. In a cylindrical baler comprising:

a front section;

a bale discharge gate pivotably mounted to said front section;

a hydraulic cylinder for moving said bale discharge gate back and forth between a closed position for bale formation and an open position for bale discharge;

a latch assembly including:

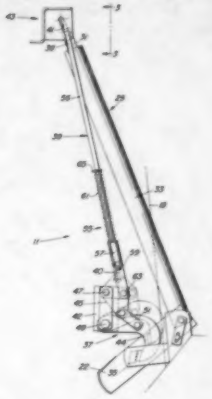
(1) a latch member fixed to said front section,

(2) a latch hook on said gate for engaging and disengaging said latch member, and

(3) an actuator means connected at one end to said latch hook and at the other to said hydraulic cylinder for engaging and disengaging said latch hook with said latch member responsive to the retraction and extension respectively of said cylinder, said actuator means comprising lost motion means for permitting the full retraction of said cylinder without moving said latch hook;

the improvement wherein:

said actuator means comprises an arm connected at one end to said cylinder and having a stop fixed thereon; and



said lost motion means includes (1) a sleeve fixed to said latch hook for slidably receiving the other end of said actuator arm therein and (2) a spring on said arm and extending between said stop and one end of said sleeve, said spring biasing said arm relative to said sleeve.

4,407,191

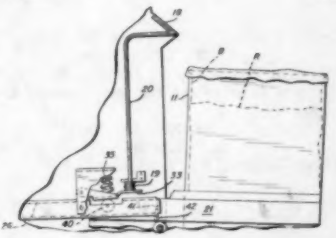
WEIGHT INDICATOR FOR REFUSE COMPACTOR

Robert A. Brenner, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 24, 1981, Ser. No. 305,323

Int. Cl.³ B30B *15/00*

U.S. Cl. 100—99 **16 Claims**



1. In a refuse compactor having a receptacle into which refuse is placed for compaction and subsequent disposal, and means for mounting the receptacle for selective reciprocative rectilinear movement for selective disposition of the receptacle in a recessed compaction position and an accessible position, the improvement comprising

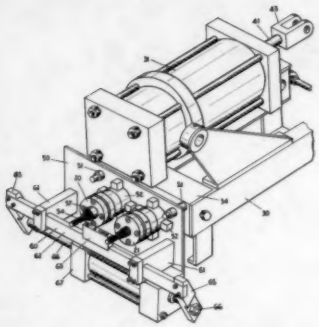
indicating means indicating the weight of the refuse previously placed in the receptacle upon movement of the receptacle from the compacting position to the accessible position to provide an indication of the additional amount of refuse which may be further placed in the receptacle in said accessible position before reaching a desired maximum weight.

4,407,192

MARKING MEANS FOR HOSE COUPLING EXPANSION ATTACHMENT MACHINE

Lyndall W. Lyon; Phillip G. Reneau, and Paul G. Coppock, all of Battle Creek, Mich., assignors to The Citation-Walther Corporation, Grand Rapids, Mich.

Filed Oct. 23, 1981, Ser. No. 314,189
Int. Cl.[3] B23P 19/04; B44B 5/00
U.S. Cl. 101—7 4 Claims



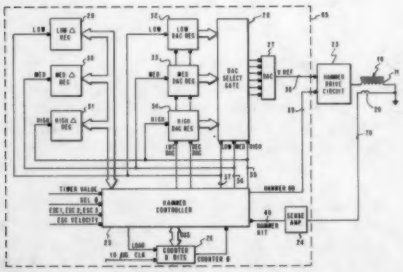
1. In a hose coupling expansion attachment machine including means for internally expanding a circular cylindrical hose coupling having a rotatable female external end section in the end of a hose to attach it thereto, the improvement which comprises a marking means on the front of said machine adjacent said expanding means so as to be in marking alignment with the curved periphery of said rotatable female external end section of said hose coupling, said marking means being linearly moveable between a non-marking position and a marking engagement position so that as said marking means passes into and through said marking position, said female end section will be rotated to provide the desired marking on the curved periphery of said female end section whereby the marking operation is accomplished simultaneously with the internal expansion of said hose coupling.

4,407,193

SOLENOID IMPACT PRINT HAMMER WITH UNIFORM FREE FLIGHT TIME

David A. Hall, and George P. Olson, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,702
Int. Cl.[3] B41J 7/92
U.S. Cl. 101—93.01 5 Claims



1. In an impact printer comprising means responsive to a driving signal for driving a print hammer against a print wheel to impact said print wheel against a printing medium and means for disengaging said driving means from said print hammer at a point prior to impact, the improvement comprising:

means for controlling the amplitude of the driving signal to said means for driving said print hammer against said print wheel;

means for storing a delay value representing the desired ideal time at which said print hammer should impact said printing medium;

means for sensing the actual time at which said print hammer impacts said printing medium;

means for storing a time value representing the average deviation from the ideal time at which the print hammer previously impacted said printing medium;

means for calculating a new average deviation from the ideal time based on the previous average deviation from the ideal time, the actual time and the ideal time;

means for storing a predetermined time range;

means for comparing said new average deviation from the ideal time to said predetermined time range; and

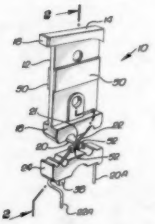
means responsive to said means for comparing for adjusting said means for controlling the amplitude of said driving signal when said new average deviation from the ideal time is not within said predetermined time range.

4,407,194

PRINT HAMMER

Val K. Jezbera, Thousand Oaks, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 122,064, Feb. 5, 1980, abandoned. This application Jan. 15, 1982, Ser. No. 339,747
Int. Cl.[3] B41J 9/30
U.S. Cl. 101—93.34 15 Claims



1. In a print hammer for use in a hammer bank assembly which has a plurality of hammers interleaved with a plurality of spaced magnets, said hammer including a body comprising a pair of thin metal flag panels and a wire coil sandwiched between said flag panels, a pair of crossed spring wires extending from said panels, each of said spring wires being electrically connected to a different end of said coil, and a foot section through which said spring wires extend, the improvement wherein said spring wires are substantially as flexible in a direction lateral to their direction of travel when energized in said hammer bank assembly as they are in the direction of hammer travel.

4,407,195

SCREEN PRINTING MACHINE

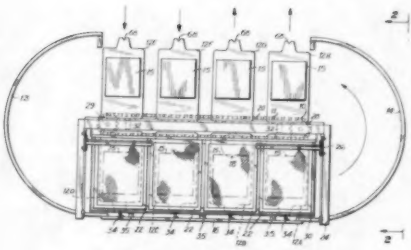
David Jaffa, Franklin Lakes, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

Filed Aug. 7, 1980, Ser. No. 176,067
Int. Cl.[3] B41F 15/10
U.S. Cl. 101—123 8 Claims

1. A screen printing machine having a plurality of adjacent printing stations, said screen printing machine comprising:

a supporting frame,

a rail mounted on said supporting frame,
a plurality of pallet assemblies spaced from said rail,
a drive means including a motor for operatively interconnecting and displacing said pallet assemblies along a path defined by said rail,
a printing head mounted on said frame for movement between an operative printing position at each of the printing stations and an inoperative non-printing position spaced from each of said printing stations,
means for selectively indexing said pallet assemblies to successive printing stations and stations separated by at least one intermediate printing station,
said means for selectively indexing said pallet assemblies between successive and spaced apart printing stations comprising:
a ram stop cam driven by said motor,
said ram stop cam having a single notch in the periphery thereof,
a ram stop link assembly responsive to the movement of said printing head between said printing position and said non-printing position,
a ram stop lever pivotally mounted on said ram stop link assembly, and



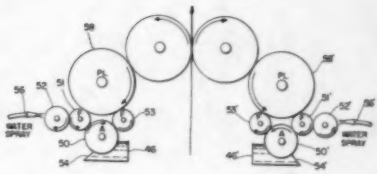
a cam follower mounted on said ram stop lever and positioned to selectively engage said notch in the ram stop cam periphery,
first and second stop means integral with said ram stop cam and said ram stop lever, respectively, for engaging first and second portions of said ram stop link assembly,
third stop means on said ram stop link for displacing said pallet assemblies at least two positions,
an index arm pivotally mounted on said ram stop link assembly,
an index control sprocket,
a second sprocket coupled to and rotatable with said cam stop cam,
said index control sprocket being larger in diameter than said second sprocket by an integer that determines the spacing between which said pallet assemblies are indexed,
a chain trained about said first and said second sprockets,
an index pin selectively positionable in said first sprocket for rotation therewith, and
said index pin being positionable to engage and displace said index arm whereby said index arm engages said third stop means and angularly displaces said ram stop lever and said pallet assemblies are displaced at least two positions.

4,407,196

METHOD OF ENHANCING INKING IN OFFSET PRESSES

Harshad D. Matalia, Easton, Pa., and Menashe Navi, New York, N.Y., assignors to American Newspaper Publishers Association, Easton, Pa.

Continuation-in-part of Ser. No. 125,827, Feb. 29, 1980, abandoned. This application Mar. 24, 1982, Ser. No. 361,276
Int. Cl.³ B41F *7/12, 7/30, 31/06, 7/36*
U.S. Cl. 101—142 **1 Claim**



1. Method of enhancing high viscosity inking in a rotary newspaper web offset printing press system of the type applying high viscosity ink to both sides of the web; providing a press system with dual printing units, one on each side of the web, each printing unit including a blanket cylinder, a plate cylinder contacting said blanket cylinder, and an inking and dampener component contacting said plate cylinder, each component having an ink reservoir with an inking cylinder rotatably positioned therein, a pair of form rollers rotatably contacting said inking cylinder and a water reservoir with a watering cylinder rotating positioned therein so as to contact one of said form rollers; said plate cylinder independently contacting said pair of form rollers;

A. Defining a plurality of repository cells each conformed as a truncated pyramid within the surface of each inking cylinder and each watering cylinder, such that there are 200–360 cells per linear inch;

B. Immersing said inking cylinder repository cells by rotating each said inking cylinder within its ink reservoir where the ink has a hydrocarbon base and a viscosity in the range 3,500–5,000 centipoises and immersing said watering cylinder in said water reservoir by means of a spray dampener;

C. Reverse angle scraping of excess ink from the surface of each said inking cylinder;

D. Further rotating said inking cylinder and inking cylinder repository cells against the surfaces of said pair of form rollers and rotating said watering cylinder against one of pair of form rollers;

E. Rotating each said form roller against the surface of said plate cylinder, printing by rotating said blanket cylinders against opposite sides of a newspaper web moving therebetween such that the speed of rotating said inking cylinder, plate cylinder and blanket cylinder is at speed of printing up to 2,500 lineal feet per minute;

F. Sequentially immersing each inking cylinder and watering cylinder within said reservoirs.

4,407,197

DEVICE AND METHOD OF MONITORING DAMPENING AND INKING EQUILIBRIUM IN OFFSET PRINTING UNITS

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

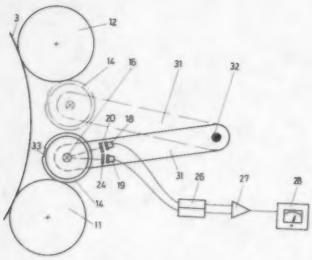
Division of Ser. No. 206,625, Nov. 13, 1980, abandoned, which is a continuation of Ser. No. 933,617, Aug. 14, 1978, abandoned.

This application Apr. 15, 1982, Ser. No. 368,647

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1977, 2736663

Int. Cl.³ B41F *7/26, 31/10, 33/00*

U.S. Cl. 101—148 **6 Claims**



1. Device for testing dampening liquid and ink equilibrium in offset printing units having a plurality of dampening liquid applicator rollers defining a dampening film flow path and a plurality of ink applicator rollers defining an ink film flow path, comprising a solitary test roller disposable in at least one of the flow paths and having an outer casing surface partly of hydrophilic and partly of oleophilic construction, means for effecting contact between said solitary test roller and at least one roller of the respective pluralities of dampening liquid and ink applicator rollers so as to form a corresponding film thereon and means cooperating with said test roller for sensing and evaluating the thickness of the dampening liquid and the ink films, respectively, and thereby testing dampening liquid and ink equilibrium, said test roller being pivotally mounted and being contactable alternately with the one ink applicator roller and the one dampening liquid applicator roller, and said outer casing surface of said test roller being formed with a region extending in axial direction of said test roller and being non-wettable by the dampening liquid and the ink.

4,407,198

ARRANGEMENT FOR SECURING PURE SKEW ADJUSTMENT OF A PLATE CYLINDER IN A SHEET-FED ROTARY PRINTING PRESS

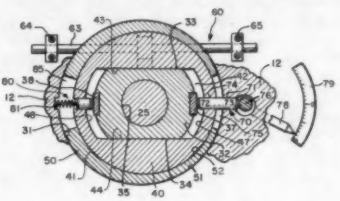
Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 368,904, Apr. 15, 1982. This application Aug. 9, 1982, Ser. No. 406,347

Int. Cl.³ B41F *13/24;* **F16H** *13/06*

U.S. Cl. 101—248 **6 Claims**

1. An arrangement for securing pure skew adjustment of a cylinder, for example, a plate cylinder in a sheet-fed rotary printing press, relative to an adjacent cylinder, comprising, in combination, a frame including side plates, first and second cooperating cylinders having their axes normally arranged in a plane and journalled in the side plates of the frame, the first cylinder having a drive end and a remote end and having stub shaft projecting coaxially therefrom, a bearing at the drive end, a bearing assembly at the remote end fitted within a cylindrical opening in the frame, said bearing assembly including a cylinder bearing telescoped over the shaft and having flat support surfaces thereon facing radially outward in opposite directions, a guide bearing having a cylindrical outer surface and having a central window extending axially therethrough for receiving the cylinder bearing, the window defining a pair of flat way surfaces facing radially inward and spaced parallel to one another for snug reception of the flat support surfaces on the cylinder bearing, the window also defining side walls spaced apart sufficiently to permit freedom of adjustment of the cylinder bearing along the way surfaces, an eccentric sleeve fitted between the opening in the frame and the cylindrical outer surface of the guide bearing, means for rockably adjusting the



eccentric sleeve to move the first cylinder toward and away from the second cylinder thereby to vary the degree of impression between them, adjusting means for positioning the cylinder bearing with respect to the way surfaces thereby to adjustably skew the first cylinder with respect to the second, and means secured to the frame for holding the guide bearing in a phase position in which the way surfaces therein are constantly oriented perpendicular to the plane which contains the axes of the cylinders notwithstanding the rocking movement of the sleeve.

4,407,199

MANDREL ASSEMBLY FOR DEMOUNTABLE PRINTING CYLINDERS OF DIFFERENT LENGTHS

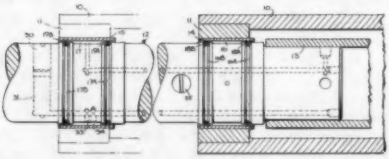
Lester I. Moss, Hackensack, N.J., assignor to Mosstype Corporation, Waldwick, N.J.

Continuation-in-part of Ser. No. 207,976, Nov. 18, 1980, which is a continuation-in-part of Ser. No. 194,616, Oct. 6, 1980. This application Aug. 12, 1981, Ser. No. 292,129

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ B41F *27/06*

U.S. Cl. 101—375 **5 Claims**



1. A mandrel assembly for supporting either a long or a short standard printing cylinder in a printing machine having bearings, each cylinder having annular end heads projecting radially inward from the inner surface of the cylinder at either end thereof provided with circular bores coaxial with the cylinder anr being demountable on said assembly, said assembly comprising:

A. a tube receivable within the cylinder to be mounted;

B. left and right journals joined to opposing ends of the tube and extending axially therefrom for insertion in said machine bearings, each journal having first and second expansible sleeves thereon in side-by-side relation, the first sleeve fitting into the bore of an end head of the short cylinder, the second sleeve fitting into the bore of an end head of the long cylinder, each sleeve surrounding an annular hydraulic chamber formed on the journals; and

C. first and second hydraulic systems associated with the chambers for said first and second sleeves, each system including an internal longitudinal duct in the journal filled with hydraulic fluid and communicating with the related chamber, and means to subject the fluid to pressure to effect expansion of the related sleeve.

4,407,200

DETONATOR SUCH AS AN ELECTRICAL MECHANICAL OR FLAME-SENSITIVE DETONATOR

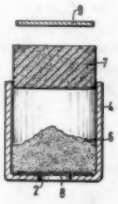
Richard Bender, Lauf, and Eugen Feuerstake, Eltersdorf, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,308

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019975

Int. Cl.³ F42C *19/12*

U.S. Cl. 102—202.5 **5 Claims**



1. In a process for the production of electrical, mechanical or flame-sensitive detonators in housings, including a primary igniting medium and secondary explosive wherein the explosive is initially compressed to a shaped member having a compressed density of about 1,7gm/cm^3; the improvement comprising: prepressing a plastic-bound explosive selected from the group consisting of octagen, hexogen or hexonite with a high temperature-resistant, thermoplastic material as a binder medium at a temperature of up to about 393° K.; pressing the primary igniting medium into the housing at a usual compressive pressure, said primary igniting medium being selected from the group consisting of loose lead azide, lead trinitroresorcinate or silver azide; said primary igniting medium being pressed with the prefinished explosive material shaped member as a press ram into the housing against the primary charge; and fastening the former through suitable fastening means.

4,407,201

RETARD SENSOR AND ENERGY CONVERTER

Norman E. Jensen, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 4, 1981, Ser. No. 260,242

Int. Cl.³ F42C *15/24*

U.S. Cl. 102—248 **3 Claims**

3. Munition arming apparatus comprising, in combination:

a first fixed contact;

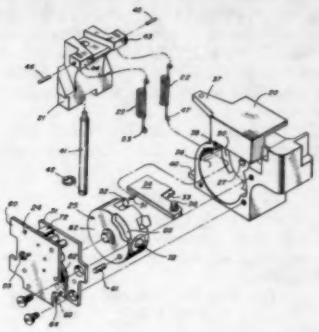
a second contact effective upon engagement with said first contact to perform an arming function;

a rotor carrying said second contact for movement into engagement with said first contact;

an initial mass linearly moveable between first and second position;

flexing spring means connected to said mass in said rotor for causing rotation of said rotor in a first direction when said mass is in said first position, and in a second direction when said mass is in said second position;

latch means normally preventing rotation of said rotor in said first direction; and



means disabling said latch means when said mass is in said second position.

4,407,202

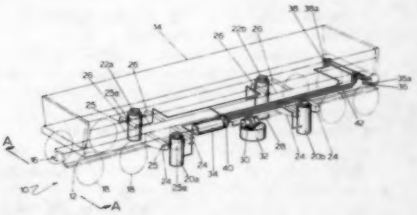
HYDRAULICALLY ACTUATED RAILWAY CAR DUMPING SYSTEM

Dennis L. McCormick, 551 Emerson Ave. West, Mendota Heights, Minn. 55118

Filed Apr. 3, 1980, Ser. No. 136,807

Int. Cl.³ B60P *1/16*; B61D *9/02, 9/06*

U.S. Cl. 105—271 **18 Claims**



1. For use in a railroad dump car which includes movable means for causing dumping of contents of the dump car, the improvement comprising:

hydraulic reservoir means for providing hydraulic fluid;

pump means driven by a source of power associated with the railroad dump car for pumping hydraulic fluid under pressure from the hydraulic reservoir means;

hydraulic accumulator means for receiving the hydraulic fluid from the pump means and storing the hydraulic fluid under pressure;

hydraulic actuator means for moving the movable means to cause dumping of contents of the dump car; and

means for selectively causing the hydraulic accumulator means to supply pressurized hydraulic fluid to the hydraulic actuator means causing the hydraulic actuator means to move the movable means to cause dumping of contents of the dump car.

18. A side dumping railway car comprising in combination:

a plurality of wheels;

a car frame carried on said wheels;

a dump body pivotally connected to the car frame;

hydraulic actuator means comprising a plurality of hydraulic cylinders, each hydraulic cylinder connected to a pivot point on said car frame at one end of the cylinder and to a pivot point on the dump body at the other end of the

cylinder, to permit tilting of the dump body relative to the car frame;

reservoir means for providing oil;

oil accumulator means for accumulating pressurized oil;

tilt control valve means connected between the accumulator means and the hydraulic actuator means for selectively providing pressurized oil from the accumulator means to the hydraulic actuator means to operate the hydraulic actuator means; and

an air to oil pressure intensifier on said car adapted to pump oil from the reservoir means to the oil accumulator means.

4,407,203

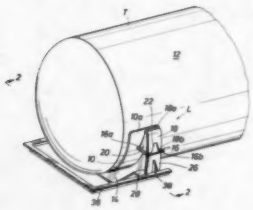
RAILROAD TANK CAR LIFT LUG

Wayne D. Harbin; Marvin Stark, and Kenneth W. Britt, all of Houston, Tex., assignors to Richmond Tank Car Company, Houston, Tex.

Filed May 11, 1981, Ser. No. 262,591

Int. Cl.³ B61K *5/00*; B61D *5/00*

U.S. Cl. 105—462 **8 Claims**



1. A railroad tank car lift lug for receiving and securing a lifting device to a tank car, comprising:

a bolster pad mounted adjacent an end of the tank car;

a vertically disposed bolster web depending from said bolster pad, said bolster web having a substantially horizontal extending upper edge;

a substantially horizontal base plate mounted on said extended upper edge of said bolster web with an inner edge of said horizontal base plate secured to said bolster pad;

a substantially vertical lift lug plate with an upper edge secured to said bolster pad and a lower edge secured to said base plate;

a pair of generally triangular lift lug webs each having a lower edge secured to said base plate, an outer edge secured to said lift lug plate and an inner edge secured to said bolster pad; and

said lift lug plate having an opening adjacent said lower edge of said lift lug plate.

4,407,204

DOOR-LOCKING MECHANISMS FOR SECURITY ENCLOSURES

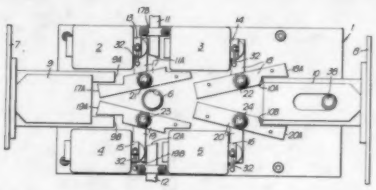
Geoffrey M. Ward, Wombourne, England, assignor to Chubb & Son's Lock and Safe Company Limited, London, England

Filed Nov. 25, 1981, Ser. No. 324,745

Int. Cl.³ E05G *1/04*; E05B *63/00*; E05C *1/04*

U.S. Cl. 109—59 R **12 Claims**

1. A door for a security enclosure having a locking mechanism comprising a main boltwork and a plurality of independently-operable locks for resisting withdrawal of the boltwork when in its thrown condition, wherein at least one of said locks can be selectively negated independently of the other locks; the or each such negatable lock having a bolt coupled to a movable locking member such that throwing the lock bolt moves the respective locking member into a locking position to resist withdrawal of the main boltwork; and further comprising control means in respect of the or each such negatable lock which are selectively operable, only while the respective lock bolt is thrown, to withdraw the respective locking member



from its said locking position and to resist subsequent withdrawal of the respective lock bolt.

4,407,205

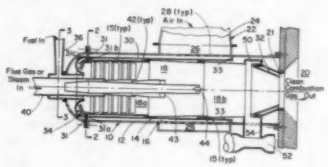
REGENERATIVELY COOLED COAL COMBUSTOR/GASIFIER WITH INTEGRAL DRY ASH REMOVAL

Albert H. Beaufrere, Huntington, N.Y., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 30, 1982, Ser. No. 373,582

Int. Cl.³ F23D *1/02*

U.S. Cl. 110—264 **10 Claims**



1. A coal combustor/gasifier comprising:

(a) a pressure vessel, said pressure vessel having a closed end and an open end and being adapted to make a pressure tight connection at said open end to a second stage combustor;

(b) an inner shell, formed from a high temperature, corrosion-erosion resistant material, substantially concentric with said pressure vessel, and defining a combustion volume having a closed end, a mixing/combustion zone adjacent to said closed end, and an ash separation-removal zone opening into the throat of said second stage combustor, and also defining with said pressure vessel a plenum through which air flows, between said pressure vessel and said inner shell, said inner shell also having;

(1) a plurality of axially spaced slots for diverting air flow from said plenum along the inner surface of said inner shell in the direction of said second stage combustor, whereby the boundary layer at said inner surface is stabilized and said inner shell is cooled; and

(2) an additional opening adjacent said closed end of said volume for admitting a flow of combustion air into said volume;

(c) air inlet means for introducing a flow of air into said plenum;

(d) first swirler means adjacent said additional opening for imparting a swirling motion to said combustion air;

(e) fuel inlet means for introducing a flow of fuel into said mixing/combustion zone, said fuel inlet means further comprising second swirler means for introducing a swirling motion opposite that of said combustion air in said fuel flow, said swirling motions being such that the opposed swirls assure that said fuel and said combustion air are well mixed in said mixing/combustion zone, and such that a residual swirl tending to move ash formed in said mixing-

/combustion zone to said boundary layer is established in said separation-removal zone; and

(f) ash removal means adjacent said open end for withdrawing said flow of air along the inner surface and the ash entrained therein.

4,407,206

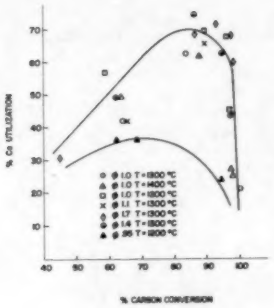
PARTIAL COMBUSTION PROCESS FOR COAL

William Bartok, Westfield, and Howard Freund, Somerville, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 10, 1982, Ser. No. 376,725

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **8 Claims**



1. A process for partially combusting coal which contains greater than about 1 wt.% sulfur, wherein the generation of SO_x is minimized, which process comprises:

(a) providing a coal containing more than about 1 wt.% sulfur and containing organically bound calcium to sulfur in a ratio of at least about 0.8 to 1;

(b) burning the coal to about 80% to 95% carbon conversion at temperatures greater than about 1,100° C. in a first combustion zone in the presence of an oxidizing agent but under reducing conditions such that the equivalence ratio of coal to oxidizing agent is less than 1.5 but greater than or equal to 1.0;

(c) separating the resulting solid effluent from the gaseous effluent from the first combustion zone;

and

(d) burning the gaseous effluent at a temperature from about 1,000° C. to about 1,500° C. in a second combustion zone under oxidizing conditions.

4,407,207

DRILL HAVING DISK FURROW OPENERS

Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen Werke H. Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany

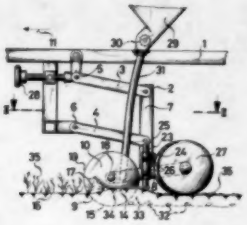
Continuation of Ser. No. 27,321, Apr. 5, 1979, abandoned. This application Dec. 1, 1982, Ser. No. 445,827

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1978, 2814883

Int. Cl.³ A01C *5/00*

U.S. Cl. 111—85 **6 Claims**

1. A drill comprising a frame, a disk furrow opener, a seed tube extending downwardly from the frame to terminate on the side of the disk furrow opener opposite the side opening the soil, mounting means joining the furrow opener to the frame, the disk furrow opener being rotatably mounted on the mounting means and being disposed at an acute angle alpha to the line of travel of the drill, the mounting means being movable in a verticle plane, a runner secured to the mounting means having a sliding surface disposed above the bottom edge of the disk and on the side of the disk opposite side on which the seed tube terminates, for enabling the soil particles or cohering pieces of soil lifted by the disk furrow opener to fall back unturned into the seed furrow produced by the furrow opener, the runner being disposed at an acute angle alpha' to the line of travel



which is slightly greater than the acute angle alpha between the share disk and the line of travel, and means for controlling the depth of penetration of the furrow opener connected to the frame.

4,407,208

TEMPLATE FOR TOPSTITCHING JOINED WORKPIECE PARTS

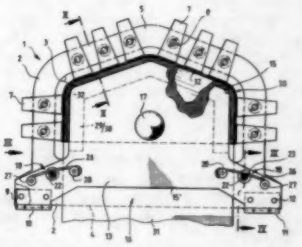
Horst Meyer, Bad Salzuflen, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Dec. 28, 1981, Ser. No. 334,824

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 8109780[U]

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—121.12 **5 Claims**



1. A template for topstitching joined workpiece parts on a sewing machine comprising:

stitch forming means including a needle;

a bed plate;

an upstanding stud formed with a stitch hole cooperating with said needle; and

template feeding and guiding means, said template comprising further:

a lower plate formed with a guide groove embracing said stud;

an upper plate pivoted at said lower plate by hinge means;

clamping means for holding said two plates in pressed relation for clamping said workpiece parts interposed between said plates;

track means cooperating with said feeding means;

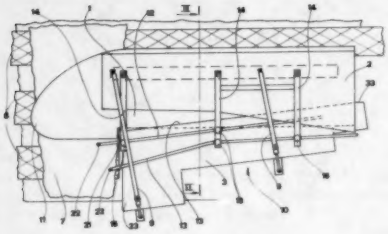
an opening being formed by said plates in the area of said hinge means for loading said workpiece parts by a loading plate.

4,407,209

WORKPIECE FOLDING GUIDE FOR CUTTING AND SEWING MACHINES

Giuseppe Saetti, Costermano, Italy, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1981, Ser. No. 296,685
Claims priority, application Italy, Sep. 5, 1980, 40069 A/80
Int. Cl.[3] D05B *35/04*
U.S. Cl. 112—147 4 Claims



1. A workpiece folding guide for receiving workpieces from a conveyor and presenting them in a folded condition to a sewing and cutting machine, said workpiece folding guide comprising:

(a) a first plate element operatively connected to the conveyor for receiving a workpiece thereunder from said conveyor;

(b) a second plate element extending parallel with and connected in vertically spaced relation to said first plate element;

(c) a third plate element (3) connected to said first and second plate elements and supported to extend parallel with and between the latter including:

(i) telescopic members (9) connected to said first and second plate elements for selectively changing its operating position between the latter;

(ii) an edge extending at an angle oblique to the direction of movement of a workpiece through the guide; and

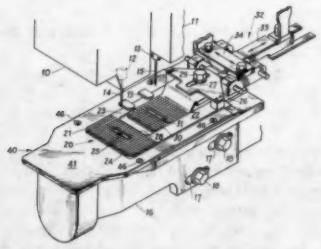
(d) means operatively associated with the upper surface of said third plate element (3) for pressing a workpiece into frictional contact therewith during advance and the folding of the workpiece within said folding guide.

4,407,210

TWIN NEEDLE WITH ADJUSTABLE THROAT PLATE AND FEED PLATE

Wilhelm H. Jung, Mechanicsville, and George P. Diacont, Jr., Richmond, both of Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed Apr. 9, 1982, Ser. No. 367,148
Int. Cl.[3] D05B *1/08*
U.S. Cl. 112—167 11 Claims



1. In a sewing machine having a spaced pair of needles reciprocally driven for sewing and means for changing the space between said needles,

throat plate means providing a spaced pair of needle holes each aligned with a different one of said needles and means for changing the space between and realigning said needle holes when the space between said needles is changed,

feed plate means above said throat plate means and moved for feeding material during sewing,

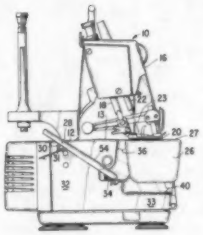
said feed plate means having a spaced pair of slots aligned to continuously expose said spaced pair of needle holes during sewing and means for changing the spacing between and realigning said slots when the space between said needles is changed.

4,407,211

CONVERTIBLE BED FOR OVEREDGE SEWING MACHINE

Hiroshi Kiyoshima, Utsunomiya, Japan, assignor to The Singer Company, Stamford, Conn.

Filed Jun. 26, 1981, Ser. No. 277,758
Claims priority, application Japan, Sep. 2, 1980, 55-124501[U]
Int. Cl.[3] D05B *73/10*
U.S. Cl. 112—260 1 Claim



1. An overedge sewing machine comprising a frame, said frame including a bed (12) having a work supporting surface (13), said work supporting surface (13) supported in part by a vertical side wall (32) and an adjacent vertical front wall (42), said bed (12) further including an extension (33) to said vertical side wall (32) and a portion (26) projecting laterally from said extension (33) beyond said sewing machine on the opposite side of said extension (33) from said vertical front wall (42), said projecting portion (26) forming with said extension (33) an upper surface (27) coplanar with said work supporting surface (13) of said bed, said upper surface (26) having slots (51) therethrough in the direction of said vertical side wall (32), said projecting portion (26) having a cross section for accommodation in a cylinder of work material, said frame supporting sewing instrumentalities including a sewing needle (23) movable into an opening (35) in said extension (33) for cooperation with other of said sewing intrumentalities in the formation of stitches, said bed supporting a work feeding system for feeding a work material in a line of feed relatively to said sewing instrumentalities and substantially parallel to said vertical side wall (32), said feeding system including a feed bar (46) supported in said bed and having an end (47) thereof jutting from said bed to said opening (35) in said extension (33) to said vertical side wall (32), a feed dog (20) supported on the end of said feed bar (46), said feed dog (20) extending into said slots (51) in said upper surface (27), a first and second groove (36, 40) in said vertical side wall (32) and in said extension (33) about said laterally projecting portion, said first groove (36) extending through said vertical side wall (32) behind said sewing needle (23), a bridge (44) extending from said vertical side wall (32) around said first groove (36) to said extension (33) of said vertical side wall (32), said bridge (44) forming one wall of said first groove (36), a pivot pin (30) extending from

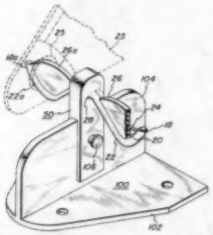
said vertical side wall (32) of said bed adjacent the work supporting surface (13) thereof, a work support plate (28) with a top surface (54) having an edge adjacent said vertical side wall (32), said top surface (54) including a finger (29) adapted to fit into said first groove (36) behind said sewing needle (23), said work support plate (28) pivotable on said pivot pin (30) from a first position with said top surface (54) coplanar with said work supporting surface (13) of said bed (12) and said upper surface (27) of said projecting portion (26) to a second position with said top surface (54) and said finger (29) separated from said upper surface (27) and with said grooves (36, 40) about said laterally projecting portion (26) exposed to accommodate an edge of a cylinder of work material.

4,407,212

TACK HOOK ASSEMBLY FOR SAIL BOATS

Robert C. Anderson, Jr., 26 Lark St., Gloversville, N.Y. 12078

Filed Oct. 26, 1981, Ser. No. 314,683
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—108 **11 Claims**



1. A tack hook assembly for attaching a sail to the bow of a sailboat, wherein the tack hook is mounted on the sailboat and an eye hole is located at the tack of the sail, said assembly comprising:

an upright support member having two opposed ends, the first end having mounting means for affixing said member to the bow of the sailboat;

a rigid lateral member attached to the second end of said upright support member and extending outwardly therefrom, said lateral member having a first substantially convex-shaped section wherein the curved outer section thereof extends generally in a downward direction;

a resilient member spanning a space defined by the curved inner section of the first convex-shaped portion and extending to a point near the lateral member, said resilient member having a second substantially convex-shaped portion wherein the curved outer section thereof extends generally in an upward direction, such that the combination of said first convex-shaped portion and said second convex-shaped portion provide a substantially biconvex configuration, and the total distance between the apexes of the two convex-shaped portions is greater than the diameter of said eye hole.

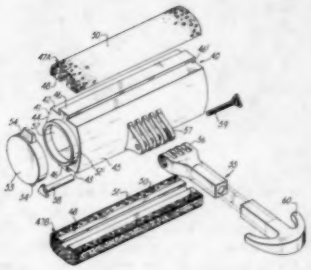
4,407,213

CLEANING IMPLEMENT FOR BOATS

Peter R. Evans, 4 Hengrave Close, Stoke Park, Ipswich, Suffolk, England

Continuation of Ser. No. 205,706, Nov. 10, 1980, abandoned. This application Nov. 3, 1982, Ser. No. 438,839
Claims priority, application United Kingdom, Nov. 15, 1979, 7939540; Apr. 24, 1980, 8013475
Int. Cl.³ B63B *59/08*
U.S. Cl. 114—222 **4 Claims**

1. A hand-manipulable cleaning implement, for cleaning the bottom of a boat while the boat remains in the water, which comprises an elongated handle; a cleaning head, including a single elongate hollow stock, which is attached to, and elongate transversely of said handle, said hollow stock being provided with a filler aperture, a removable filler cap for closing said aperture, and a plurality of external, circumferentially spaced, longitudinal mounting rails for receiving respective different cleaning devices comprising strips of resilient material attached to channel-shaped mounts for detachably secured engagement with the respective mounting rails, whereby said strips extend longitudinally of said hollow stock; wherein said mounting rails of said cleaning head are of identical form and the mounts of said cleaning devices are of identical form so that said cleaning devices are interchangeable and any cleaning



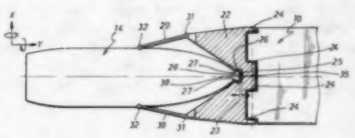
device may be attached on any selected mounting rail; and said filler aperture being large enough to permit throughpassage of and such hollow stock being large enough to permit storage therein of said cleaning devices; said filler cap being removable for permitting the introduction, through the said filler aperture into said stock, of either said detachable cleaning devices and of a desired quantity of water to adjust the buoyancy of the stock of the cleaning head during use to optimize the cleaning action of the implement in cleaning a boat bottom by movement of said cleaning head over the boat bottom as a result of manipulation of said handle.

4,407,214

NON-ROLL TUG-AND-BARGE LINKAGE

Masasuke Kawasaki, 1002 Michigan Ave., Slidell, La. 70458

Continuation-in-part of Ser. No. 138,642, Apr. 8, 1980, abandoned. This application Dec. 19, 1980, Ser. No. 218,052
Int. Cl.³ B63B *21/00*
U.S. Cl. 114—249 **46 Claims**



1. An apparatus for coupling first and second vessels, the apparatus minimizing roll of one vessel relative to the other while permitting freedom of movement for pitching and heaving of one vessel relative to the other, comprising:

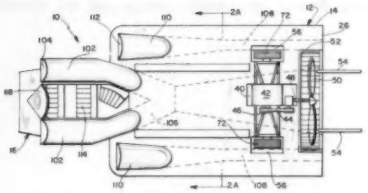
a linkage frame pivotally secured to one end of the first vessel along a substantially horizontal axis, the linkage frame defining a recess generally facing the second vessel and comprising elongated, inner opposing surfaces;

mating means for aligning one end of the second vessel between the inner opposing surfaces of the linkage frame such that the mating means and the inner opposing surfaces engage to minimize roll of the second vessel relatively to the first vessel; and

means for securing the second vessel to the linkage frame such that freedom of movement of the second vessel

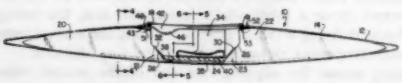
relatively to the first vessel for pitching and heaving is permitted.

4,407,215
UNIQUE FAN-POWERED WATER VESSEL
Reno R. J. Cyr, 51 Burton St., Cranston, R.I. 02920
Filed Dec. 14, 1981, Ser. No. 330,559
Int. Cl.³ B63B *1/38*
U.S. Cl. 114—289 **11 Claims**



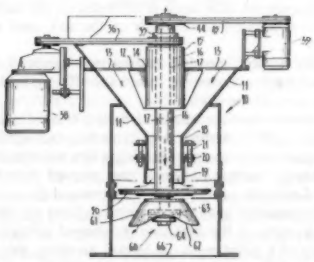
1. A multi-purpose air powered boat having a hull including an essentially flat bottom main section and an upper surface in turn supporting a power housing generally centrally disposed and in turn including an air propellor mounted at the rear thereof and a power supply for rotating said propellor supported by said power housing, said flat bottom main section including a centrally disposed relatively narrow depth, open bottom air tunnel of substantial width longitudinally extending from a point proximate the front to the rear of said main section and a pair of secondary air tunnels positioned on opposite sides of said central tunnel and proximate the side edges of said main section, said secondary tunnels extending into the said flat bottom a depth substantially greater than and of a width substantially less than said central tunnel, and air scoop means disposed at the front of said boat for separately receiving air flow into said tunnels when said boat is forwardly driven by said propellor wherein air is forced between said flat bottom and the supporting water surface to form an air cushion to reduce the frictional contact therebetween primarily by said main tunnel and to provide high velocity air flow of a supporting nature to the tunnels, and whereby the lateral extent of said air cushion is controlled by the air flow through said secondary air tunnels, said air scoop means including separate air scoops connected to the front of each of said tunnels, and wherein said air scoop means include substantially tubular uninterrupted passageways directly merging into said tunnels and of a cross-sectional extent so as to move air through the tunnels to which they are associated at a speed at least equal to that at which the air moves through said passageways, the air scoop passageway means connected to said main tunnel permitting a substantially larger volume of air to be directed thereto than the individual air scoops permit to be directed to said secondary tunnels.

4,407,216
FRAME SYSTEM FOR KAYAK
William E. Masters, 138 Norris Ave., Liberty, S.C. 29657
Filed May 14, 1981, Ser. No. 263,562
Int. Cl.³ B63B *35/72*
U.S. Cl. 114—347 **19 Claims**



1. A kayak comprising:
(a) an elongated hull, said hull having a bow portion and a stern portion, and having an upper wall and a lower wall;
(b) a framework disposed within said hull, said framework including: a first frame member disposed in said bow portion and extending substantially between said upper wall and said lower wall; a second frame member disposed in said stern portion and extending substantially between said upper wall and said lower wall;
(c) means for longitudinally aligning said first and said second frame members, said aligning means being positioned generally longitudinally of said hull between said first and second frame members; and
(d) seat means disposed on top of said aligning means for holding said aligning means against said lower wall of said hull, wherein said seat means has a longitudinal tunnel formed in the bottom thereof, said aligning means being received in said tunnel in contact with said seat means, said aligning means including portions extending fore and aft of said seat means, said portions having covered recesses contacting, respectively, said first and second frame members for aligning said frame members.

4,407,217
DISTRIBUTION AND TREATMENT MEANS
Frederick D. Jackson, Dandenong, Australia, assignor to Jaybee Engineering Pty. Limited, Dandenong, Australia
Filed Mar. 29, 1982, Ser. No. 363,071
Int. Cl.³ B05B *3/10*
U.S. Cl. 118—24 **9 Claims**



1. Apparatus for coating discrete articles comprising:
supply means having a downwardly directed delivery means for discharging a continuous feed of articles;
a rotating plate beneath said supply means for receiving the articles, said plate rotating at a speed sufficient to force articles off the edge of the plate in an even peripheral distribution; and
a rotating coating assembly located below said plate, the assembly having a downwardly flared rotating annular skirt and fluid feed means extending within the skirt, said fluid feed means having radially outwardly directed apertures for applying fluid to the interior of the skirt, said skirt rotating at a rate sufficient for fluid to move down the skirt to its lower edge and be expelled outwardly therefrom to strike the articles falling from the rotating plate and about the periphery of the skirt, the lower edge of said annular skirt being in the form of a continuous curve varying in the axial direction of the skirt to form an axial zone of fluid through which the articles fall for coating.

4,407,218

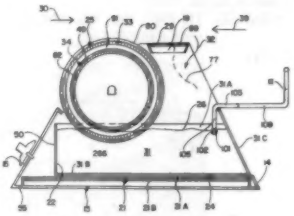
APPARATUS AND METHOD FOR APPLYING HOT WAX TO SKIS

Dale Ordas, 1520 38th St., Sacramento, Calif. 95825

Continuation-in-part of Ser. No. 243,367, Mar. 13, 1981, abandoned. This application Aug. 19, 1982, Ser. No. 409,650

Int. Cl.³ B05C *1/08*

U.S. Cl. 118—59 **10 Claims**



1. Apparatus for applying hot wax to skis comprising:

a housing;

a roller tiltably mounted to move from a lower functional position to an upper non-functional position journalled for rotation in said housing;

a fluid tight top opening chamber removably disposed in said housing below said roller for retaining hot ski wax therein;

a portion of said roller extending into the opening of said chamber, said chamber being removable upon the tilting upward of said roller;

said roller comprising a first outer drum freely rotatable about an inner drum having heating means adapted to heat the inner surface of said outer drum, whereby passing a ski over the outer surface of said outer drum and into tangential contact therewith after said outer drum has rotated through hot wax in said chamber, uniformly deposits hot wax on said ski also including a platen mounted in said housing parallel to and spaced from said roller above said chamber, whereby said ski is adapted to be passed into contact therewith either before or after contact with said roller in an unobstructed manner;

and means to tilt said roller.

4,407,219

PILE BRUSH FOR CONDITIONING A MOVING SURFACE

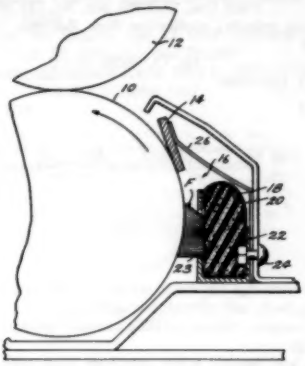
John C. Dellevoet, Brugge, Belgium, assignor to Schlegel Corporation, Rochester, N.Y.

Filed Jul. 14, 1981, Ser. No. 283,149

Int. Cl.³ B05C *11/105*

U.S. Cl. 118—60 **5 Claims**

1. In a fusing system for fusing toner images in an electrostatic copying machine in which a roll surface is used to fix the toner images to copy sheet material, an improved device engageable with the roll for conditioning the surface thereof comprising a liquid-retaining reservoir in the form of a core of compressible, resilient sponge-like material, a woven sheet wrapped around and encasing said reservoir, the portion of said sheet adjacent said roll surface having a brush-like fibrous textile pile layer thereon formed by filaments extending through said sheet, said filaments having outer ends in contact with said roll surface and having inner portions disposed on the side of said sheet facing said reservoir and in wicking contact with said reservoir to thereby conduct liquid from the core to the surface of the roll, the remainder of said sheet being free of pile.



4,407,220

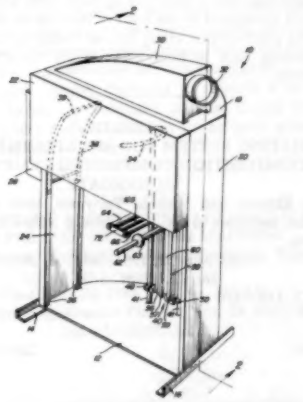
CEMENT SPRAYING MACHINE FOR TIRES

Lloyd W. Fesmire, 580 W. Church St., Lexington, Tenn. 38351

Filed May 14, 1981, Ser. No. 264,184

Int. Cl.³ B05B *1/28, 13/00*; B05C *13/02*

U.S. Cl. 118—64 **6 Claims**

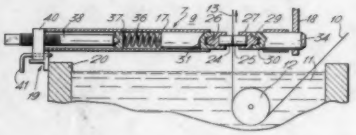


1. A machine for applying a coating of cement to the exterior surface of a tire preparatory to recapping the tire comprising a generally vertically disposed cover defined by a top support and depending front, side and end covers having an opening in a lower portion thereof to enable insertion and removal of tires, said cover including vent means communicating with the interior of the upper portion of the cover for exhausting material from the cover, tire carrier means in said cover for movement between a tire loading and discharging lowered position and a cement applying elevated position and means in said cover above the opening for applying cement to the exterior surface of the tire when in elevated position so that cement fumes will be exhausted from the cover through the vent means.

4,407,221
COATING OF WIRE

Colin D. Peel, Auckland, New Zealand, assignor to New Zealand Wire Industries Limited, Auckland, New Zealand

Filed Dec. 19, 1980, Ser. No. 218,280
Claims priority, application New Zealand, Jan. 22, 1980, 192668
Int. Cl.³ B05C *11/02*
U.S. Cl. 118—109 **12 Claims**

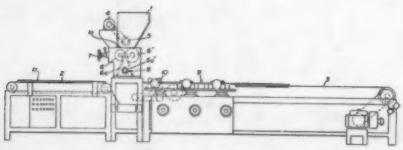


1. A cartridge for use in wiping a filament emerging from a coating bath, said cartridge comprising:
an elongate, tubular housing member having a lateral opening;
first and second wiper members each supported by said housing member and positioned within said lateral opening;
means slidably mounting at least one of said wiper members for movement relative to the other said wiper member and longitudinally of said housing member;
resilient biasing means carried by said housing and urging said movable wiper member towards and into juxtaposition with the other said wiper member, said biasing means including adjustment means carried by the housing and adapted to be actuated from a position exterior of said coating bath, said resilient biasing means and said adjustment means extending axially of said housing; and
means carried by said housing member for supporting said cartridge above said coating bath with said wiper members positioned in the path of movement of said filament and which permit ready release of said cartridge from said coating bath without substantially disturbing that filament.

4,407,222
COATING SYSTEM FOR SEMI-FLUID COATING COMPOSITION COMPRISING CEMENT AND AGGREGATE

Tadao Kimura, and Hideoki Toriyama, both of Iwakunishi, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 295,067
Int. Cl.³ B05C *5/00, 11/02*
U.S. Cl. 118—110 **1 Claim**

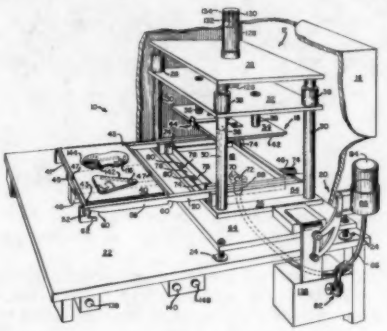


1. A coating system for a semi-fluid coating composition comprising cement and aggregate, characterized in that a hopper containing said coating composition to be supplied on a base material having a sheet form is provided at a position so as to locate a coating composition outlet port of said hopper above a base material conveyor, said base material moving past the hopper on said conveyer, and that at least one levelling roller for leveling said composition having a diameter of 10 to 200 mm is provided above said base material conveyor in front of said material outlet port along the advancing direction of the base material for rotating in the same direction as the advancing direction and at a higher peripheral speed than the speed of the base material conveyor.

4,407,223
CONTOUR CEMENTING MACHINE

Robert W. Morin, Salem; Jeffrey M. Lewis, Lynn, and Richard Bobrycki, Saugus, all of Mass., assignors to Boston Machine Works Company, Lynn, Mass.

Filed Jan. 11, 1982, Ser. No. 338,642
Int. Cl.³ B05C *1/02*
U.S. Cl. 118—212 **6 Claims**



1. A contour cementing machine comprising:
(a) a housing;
(b) a cover for said housing;
(c) a die structure mounted in said housing, said die structure including a horizontally movable workplate and a vertically movable die plate;
(d) a tray removably disposed in said housing in operative association with said die structure,
(e) means for maintaining a predetermined level of cement in said tray;
(f) said machine being pneumatically actuated and designed for applying latex cement in complex shapes to flat workpieces deposited on said horizontally movable workplate;
(g) said workplate designed for movement between a work-applying position and a cementing position and said die plate designed for vertical displacement between two operative positions: a cement pick up position, and a cement applying position; and
(h) rolling means to facilitate the movement of said workplate from its said work-applying position to its said cementing position, said rolling means not supporting said workplate in its said cementing position.

4,407,224
APPARATUS FOR HIGH SPEED SIZE APPLICATION

Robert J. Alheid, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

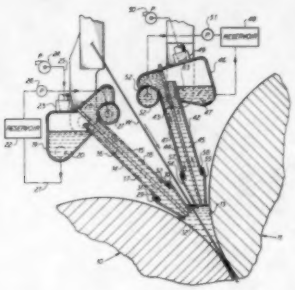
Division of Ser. No. 228,262, Jan. 26, 1981, Pat. No. 4,358,484. This application Jun. 9, 1982, Ser. No. 386,744
Int. Cl.³ B05C *3/04*
U.S. Cl. 118—405 **4 Claims**

1. An apparatus for applying a sizing composition or the like continuously to both sides of a paper web which comprises:
a pair of counter-rotating rolls defining a nip therebetween, means for directing a paper web through said nip,
a pair of applicator means, one on each side of said web, each applicator means including:
a housing,
a baffle within said housing dividing the interior of said

housing into isolated parallel fluid flow passages, terminating near said nip,

a distributor arranged to deliver sizing composition into one of said flow passages for forming a pond of sizing composition at said nip,

a reservoir for sizing composition,



means connecting said reservoir to one of said flow passages,

vacuum means connected to the other of said flow passages for withdrawing sizing composition from said pond, and

means for delivering the sizing composition thus withdrawn back to said reservoir.

4,407,225

MORTAR TREATING APPARATUS

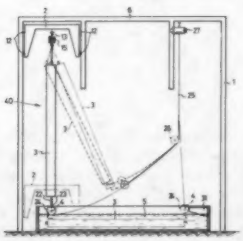
Takao Kataishi, and Nobufumi Yokoi, both of Tokyo, Japan, assignors to Misawa Home Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 325,899

Claims priority, application Japan, Jul. 23, 1981, 56-115680

Int. Cl.³ B05C *13/00*

U.S. Cl. 118—425 **5 Claims**



1. A mortar treating apparatus comprising a mortar tank, an immersing mechanism disposed above said tank and adapted for immersing a reinforcement frame for a concrete panel into mortar contained in said tank, said immersing mechanism including a first engaging portion for suspending the reinforcement frame so that the reinforcement frame hangs vertically downwardly therefrom, and a second engaging portion engageable with the lower end portion of the reinforcement frame, and means for moving at least one of the first and second engaging portions to transfer the reinforcement frame from a vertical state to a horizontal state, wherein the reinforcement frame can be immersed into said tank.

4,407,226

DEVICE FOR MANUFACTURING A MAGNETIC RECORDING MEDIUM

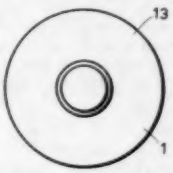
Yoshiro Nakamatsu, 1-10-309, Minami Aoyama 5-chome, Minato-ku, Tokyo, Japan

Division of Ser. No. 256,316, Apr. 22, 1981. This application Feb. 25, 1982, Ser. No. 352,252

Claims priority, application Japan, May 8, 1980, 55-59984

Int. Cl.³ B05B *5/02*

U.S. Cl. 118—623 **1 Claim**



1. A device for manufacturing a recording medium constituting a recording disc provided with a magnetic coating thereon and with said coating containing magnetic particles, said device comprising:

(a) means for coating said disc with a magnetic coating so that the latter has a thickness which decreases from a maximum to a minimum radially inwardly from the outer periphery toward the center of said disc to provide correspondingly increasing recording density from the outer periphery toward the center of said disc,

(b) and means for orienting said magnetic particles on said coated disc relative to the surface of said disc generally inversely to the change in thickness of said coating so that said particles are essentially non-oriented at the periphery of said disc in the area of maximum coating thickness and increase in orientation radially inwardly toward the center of said disc to a maximum uniform orientation in the area of minimum coating thickness to provide a recording medium having an essentially constant output from the disc periphery radially inwardly to the inner termination of said magnetic coating.

4,407,227

SURFACE SIZING AND COATING APPARATUS FOR A PAPER WEB OF A PAPER MACHINE

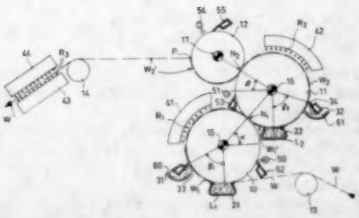
Pekka Mauranen, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Nov. 20, 1981, Ser. No. 323,427

Claims priority, application Finland, Nov. 28, 1980, 803709

Int. Cl.³ B05C *3/18*

U.S. Cl. 118—642 **14 Claims**



1. Surface sizing and coating apparatus for a paper web of a paper machine having first, second and third coating rollers positioned to form first and second coating nips with each other through which the web to be coated is arranged to pass,

said first and second coating rollers forming a first coating nip and said second and third coating rollers forming a second coating nip, said web having spaced opposite surfaces, said surface sizing and coating apparatus comprising

first coating supply means on said first coating roller for supplying a coating directly on a surface of said web;

first doctor coating means on said first roller disposed after said first coating supply means in the running direction of said web, said first coating nip being disposed after said first doctor coating means in said running direction;

second coating supply means on said second coating roller for supplying a coating directly on the opposite surface of said web; and

second doctor coating means on said second roller disposed after said second coating supply means in the running direction of said web, said second coating nip being disposed after said second doctor coating means in said running direction.

4,407,228

DEVELOPING APPARATUS

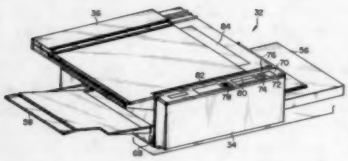
Toshimasa Takano, Sagamihara; Hideo Mukai, and Masahiro Hosoya, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 5, 1981, Ser. No. 308,791

Claims priority, application Japan, Oct. 6, 1980, 55-139627

Int. Cl.³ G03G *15/06*

U.S. Cl. 118—651 **22 Claims**



1. A developing apparatus used with an image forming system provided with a photosensitive layer on which a static latent image is impressed and which is formed of first and second portions having different surface potentials, said developing apparatus comprising:

a developing roller which is rotatably arranged and fitted with a large number of hairs for feeding a developing agent to the surface of the photosensitive layer in contact therewith, said developing agent being attracted to the first portion of the surface of the photosensitive layer with a strong attractive force and to the second portion of said surface with a weak attractive force; and

means for electrically removing that portion of the developing agent which is attracted to the second portion with a weak attractive force.

4,407,229

DIP TANK HOIST

Dale Sanborn, South Waterford, Me. 04081

Filed Jul. 20, 1981, Ser. No. 284,977

Int. Cl.³ B05C *3/09*

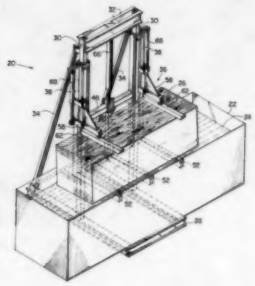
U.S. Cl. 118—702 **14 Claims**

1. A hoist for dipping a package of work product into a tank of liquid, said hoist comprising:

a pair of stationary vertical posts adapted to have their lower end portions received in and fixed relative to a tank such as aforesaid and their upper end portions extending upwardly out of said tank,

a carriage slidably supported on said two posts for vertical movement relative thereto, said carriage having a set of generally horizontal prongs at its lower end for receiving a package of work product placed thereon, said carriage also having at least one clamp located upwardly from said set of prongs movable vertically relative to said carriage into and out of engagement with a package of work product placed on said prongs,

means for moving said clamp vertically relative to said carriage into and out of engagement with a package of work product placed on said prongs, and



means for moving said carriage vertically relative to said posts to move said carriage into and out of the tank with which said hoist is associated.

4,407,230

GAS-FEED NOZZLE FOR A PYROLYTIC PARTICLE COATING APPARATUS

Eike Barnert, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 186,700, Sep. 12, 1980, abandoned. This application Jun. 4, 1982, Ser. No. 385,097

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1979, 2937652

Int. Cl.³ B05B *1/34*; C23C *11/00*

U.S. Cl. 118—716 **2 Claims**

1. A gas feed nozzle apparatus for supplying a decomposable coating-producing gas and a dilution gas to an apparatus for the coating of fuel kernels for use in a nuclear reactor, having a central channel for supplying said coating-producing gas and a surrounding channel of annular cross-section for said dilution gas defined by the wall of said central channel and an outer containing wall which is prolonged beyond the mouth of said central channel, said outer containing wall terminating in a constriction leading into an upwardly flaring entrance of a reaction vessel and comprising the improvement which consists in that:

the diameter (d_E) of the opening of said constriction (4) is in the range from 3 to 10 mm;

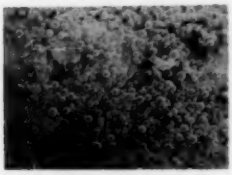
the diameter (d_z) of said central channel (1) is at least 1.225 times said diameter (d_E) of said constriction opening but does not exceed 3.5 times said constriction opening diameter, and

the spacing between the end of the inner channel wall forming the mouth thereof and said constriction is in the range of 20 to 70 mm.

4,407,231
MOVEMENT ACTIVATED ODOR CONTROL ANIMAL LITTER

David W. Colborn, Pleasanton; Thomas S. Coyne, Livermore; Carolyn P. Emrie, Pleasanton, and Barbara H. Munk, Berkeley, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 28, 1981, Ser. No. 306,466
Int. Cl.³ A01K *1/015;* C11B *9/00*
U.S. Cl. 119—1 19 Claims

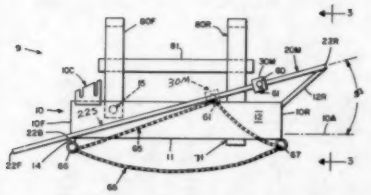


8. An animal litter formed by the steps comprising:
providing a quantity of absorbant particles;
suspending a quantity of frangible microcapsules containing a fragrance or a deodorizer in a carrier liquid to form a slurry, said slurry including an adhesive agent; and,
spraying the slurry having said frangible microcapsules suspended therein onto at least some of said absorbant particles to substantially intactly affix said frangible microcapsules onto said at least some of said particles.

4,407,232
APPARATUS FOR IMMOBILIZING ANIMALS OF RANDOMLY ENCOUNTERED SIZES

Gerald J. Konz, R.R. #1 (Box 72), Minden, Iowa 51553

Filed Mar. 8, 1982, Ser. No. 356,123
Int. Cl.³ A01K *19/00;* A61D *3/00*
U.S. Cl. 119—103 12 Claims

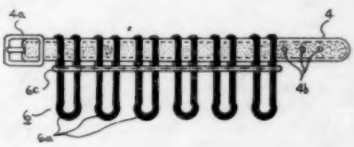


1. Apparatus for immobilizing animals of randomly encountered sizes to permit the performance of castration or other tasks, said apparatus comprising:
A. a cradle member extending longitudinally along a substantially horizontal central-axis located along floor means and disposed between laterally separated upright sides thereof whereby the cradle member will support the vertebrae of a randomly encountered animal placed supinely along said central-axis, said cradle member having, for accommodating the supinely placed animal's head and shoulders, a forward portion terminating at a fore-end and also having, for accommodating the animal's rump, a rearward portion terminating at an aft-end;
B. a forwardly and downwardly convergent canopy member attached to the cradle member and overlying only the forward portion thereof, whereby said canopy member will overlie the head, but not the frontlegs, of the supine animal and restrict the animal's head from forward and lateral movements;
C. forwardly and downwardly extending inclined-rail means attached to and laterally offset from the cradle member, said inclined-rail means lying substantially parallel to an imaginary vertical-plane passing through the cradle member central-axis, said inclined-rail means having a finite rearward-length extending rearwardly of the canopy member and wherein a major proportion of said rearward-length is disposed at higher elevation than the cradle member upright sides;
D. coupling means non-rotatably and reciprocatably slidably associated along the rearward-length of the inclined-rail means;
E. a restrainer-bar extending rigidly laterally and horizontally from the coupling means so as to overlie the cradle member and the supine animal, said restrainer-bar being adapted to press firmly against the supine animal's upstanding hindlegs as the operator manipulated the coupling means forwardly an downwardly along said inclined-rail means rearward-length; and
F. reflex resistance means to resist rearward reflexes asserted by the supine animal's upstanding hindlegs against the forwardly moved restrainer-bar.

4,407,233
SAFETY COLLAR FOR PETS

Eleanor Bozzacco, 213 Baldwin St., Orange, N.J. 07050

Filed Dec. 31, 1981, Ser. No. 336,418
Int. Cl.³ A01K *27/00*
U.S. Cl. 119—106 17 Claims



1. A safety device for pets comprising in combination:
a basic collar comprising one or more straps for securing the device around the neck of an animal;
one or more flexible members depending from one long edge of said collar in a direction transverse to the principal length direction of said basic collar straps, the distance which said flexible members extend beyond said edge substantially exceeding the width of said basic collar straps, said one or more flexible members being at least partially formed of material having a reflectivity for visible light striking the exposed surface of said material which is characterized by values of candlepower per square foot approximately within a range 52 to 164 for light entering at angles within the range −4° to +40°, as observed at angles within the range 0.2° to 0.5°, wherein said one or more flexible members comprise a plurality of elongated depending strips or strands of material spaced-apart at intervals around at least a portion of said collar.

4,407,234
PORTABLE AND ADJUSTABLE APPARATUS FOR CLEANING, GROOMING, AND OTHERWISE TREATING DOGS AND OTHER ANIMALS OF SIMILAR SIZE

Joseph F. Kleman, 38 Main St., Locust Gap, Pa. 17840

Filed Jul. 13, 1981, Ser. No. 283,085
Int. Cl.³ A01K *13/00*
U.S. Cl. 119—158 1 Claim

1. Apparatus for cleaning, grooming and otherwise treating dogs and other animals of similar size comprising, in combination,

a rectangular main housing of sufficient volume to accommodate the animal;

said rectangular main housing including a pair of fixed, spaced parallel side walls and front and rear spaced parallel end panels;

said front panel being divided at approximately the horizontal center-line of the apparatus into lower and upper panel sections;

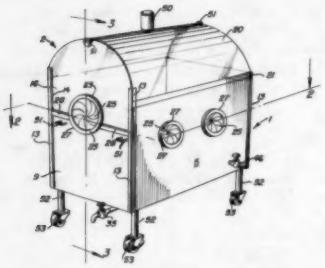
said end panels being retained at the vertical edges thereof in guide channels on said side panels and being temporarily removable;

a dome-shaped cover disposed atop said rectangular main housing;

said dome-shaped cover including a transparent portion;

a bottom member with a drain disposed in said main housing;

a horizontally extending vertically adjustable perforate platform carried by said main housing and disposed above the bottom member thereof;



a transversely extending adjustable supporting and restraining sling attached to said main housing above the perforate platform therein;

said transversely extending, adjustable supporting and restraining sling being adapted to make contact with the underside of the animal;

the upper horizontal edge of said lower front panel section and the lower horizontal edge of the upper front panel being provided with opposed and matching semi-circular recesses forming between them a circular aperture which permits the passage therethrough of the head of the animal;

an iris-shaped closure of flexible waterproof material being disposed in said circular aperture and expandable and contractible by means of a circular adjusting ring;

each of the side walls of said main housing having at least one aperture for receiving a hand and forearm of the operator of the apparatus; and

means for supplying water to the interior of said main housing.

4,407,235

SAFETY BOILER WITH HIGH EFFICIENCY

Shye-Yih Deng, 10-4 Fl., No. 62, Chang-Chun Rd., Taipei, Taiwan

Filed Mar. 31, 1982, Ser. No. 363,581
Int. Cl.³ F22B 7/00
U.S. Cl. 122—161 **1 Claim**

1. A safety boiler with high efficienty comprising:

a vaporizing chamber, positioned centrally within the boiler, which is provided with several atomizers respectively connected to a pressurized water jacekt and a steam pipe being poked into said chamber to lead steam into a coil in a combustion chamber for superheating the steam;

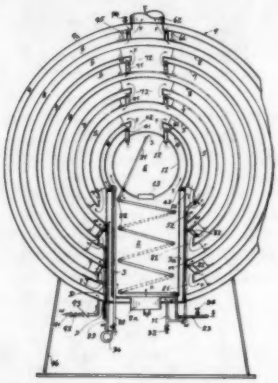
said pressurized water jacket surrounding said vaporizing chamber, which is centrally formed with a top flue hole atop thereon;

a combustion chamber heated by a burner and positioned under said vaporizing chamber;

a preheated water jacket, surrounding said combustion chamber, which is provided with water pipe communicated with said water jacket surrounding said pressurized water jacket and provided with a boosting pump to suck water from said preheated jacket and boost water into said pressurized water jacket;

a water jacket, surrounding said pressurized water jacket, which is formed with an annular flue hole between its lowest perimeter with said preheated water jacket;

a plurality of water jacket combinations each comprising an inner top-opened water jacket communicated with its inner water jacket and an outer bottom-opened water jacket communicated with its outer water jacket, being subsequently developed outwards;



a plurality of sandwiched flues each respectively partitioned between each two neighbouring water jackets, each sandwiched flue comprising a flue baffle, connecting the two neighbouring water jackets and being made as radial type or spiral type; and

an outmost water jacket, communicated with its inner water jacket and connected outwards with a stack which is communicated with said flues, being supported by a frame connected thereunder;

said vaporizing chamber and each said water jacket being respectively formed with a maintenance hole; the flue holes of each water jacket combination being made counter-current so that one flue hole of one water jacket is approaching said flue stack and another flue hole of another water jacket of the jacket combination is approaching said combustion chamber or burner for reciprocatively passing flue gas within the flues partitioned between the water jackets.

4,407,236

SLUDGE LANCE FOR NUCLEAR STEAM GENERATOR

Glen E. Schukei, South Windsor, and Frank J. Formanek, West Suffield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

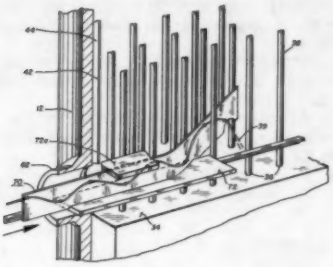
Filed Sep. 21, 1981, Ser. No. 303,698
Int. Cl.³ F22B 37/52
U.S. Cl. 122—390 **8 Claims**

1. A system having the end function of injecting fluid at high pressure into a body of sludge collected on the upper side of a tube sheet of a heat exchanger above which its tube bundle forms a free lane aligned with a handhole through the steam generator shell and the tubes form lanes at angles to the free lane, including,

a thin metallic strip having high resiliency,

at least one capillary tube attached to the metallic strip along the length of the strip,

a nozzle formed on the end of the capillary tube and positioned at the front end of the strip for movement down the free lane above the tube sheet,



a source of high pressure fluid connected to the rear end of the capillary to supply fluid to the nozzle,

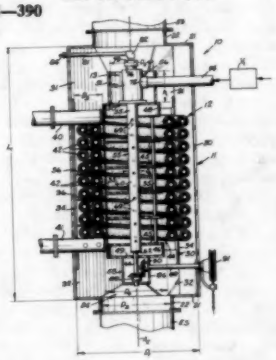
and a diverter structure positioned in the free lane above the tube sheet to engage the metallic strip and capillary combination to direct it down a tube lane which extends at an angle from the free lane.

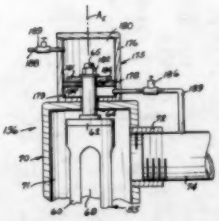
4,407,237

ECONOMIZER WITH SOOT BLOWER

John H. Merritt, Jr., Atlanta, Ga., assignor to Applied Engineering Co., Inc., Orangeburg, S.C.

Division of Ser. No. 235,667, Feb. 18, 1981, Pat. No. 4,346,674.
This application Apr. 29, 1982, Ser. No. 372,997
Int. Cl.³ F22B *37/52*
U.S. Cl. 122—390 **9 Claims**





1. An economizer construction for use in recovering heat from flue gases passing upwardly through a vertical stack via a heat transfer fluid and adapted to be cleaned with a pressurized fluid comprising:

a housing defining a generally vertically extending flue gas passage therethrough about a generally vertical central axis;

a helically wound heat transfer coil positioned in said flue gas passage for placing the heat transfer fluid in a heat exchange relation with the flue gases passing through said flue gas passage, said heat transfer coil defining a generally vertically extending opening centrally therethrough concentrically of said central axis and having a first prescribed diameter; and

a soot blower assembly including an elongate soot blower lance having an outside diameter smaller than said first prescribed diameter of said central opening through said heat transfer coil, mounting means for rotatably positioning said soot blower lance within said central opening through said coil so that the longitudinal axis of said lance is generally coaxially oriented along said central axis; drive means for selectively rotating said lance about said central axis, and fluid supply means for supplying the pressurized cleaning fluid to said lance, said lance defining a fluid passage therein in communication with said fluid supply means and defining a plurality of orifices therein for directing streams of the pressurized cleaning fluid from within said fluid passage across said central opening and onto said heat transfer coil to clean same and said mounting means including gas bearing means attached to said lance and control means for supplying pressurized fluid to said gas bearing means to operate said gas bearing means so that said gas bearing means rotatably supports said lance while pressurized cleaning fluid is supplied to said lance; wherein said lance includes a mounting shaft on the upper end thereof and wherein said gas bearing means includes a gas housing defining a fluid chamber therein into which said mounting shaft rotatably extends; a lower bearing plate mounted in said fluid chamber and dividing said fluid chamber into a lower subchamber below said lower bearing plate and upper subchamber above said lower bearing plate, said lower bearing plate defining a central opening therethrough through which said mounting shaft rotatably extends into said upper subchamber; an upper bearing plate attached to said mounting shaft in said upper subchamber so that said lance is supported thereby with said upper bearing plate overlying said lower bearing plate, said lower bearing plate defining fluid passages therethrough and said control means constructed and arranged to supply the pressurized cleaning fluid into said lower subchamber whereby the pressurized cleaning fluid passes through said fluid passages in said lower bearing plate to lift said upper bearing plate off of said lower bearing plate and maintain separation between said bearing plates when the pressurized cleaning fluid is supplied to said lance so that said lance is rotatably supported.

4,407,238

METHANOL DISSOCIATION USING A COPPER-CHROMIUM-MANGANESE CATALYST

Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Stamford, Conn.

Filed Oct. 26, 1981, Ser. No. 315,115
Int. Cl.³ C01B *1/13*; C10G *13/02*
U.S. Cl. 123—3 **7 Claims**

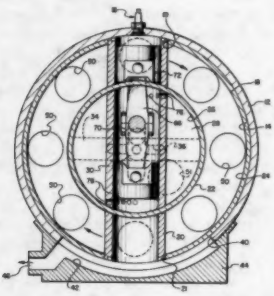
1. A method of endothermic dissociation of methanol to hydrogen and combustion thereof in an internal combustion engine comprising the steps of:

(a) providing a liquid methanol fuel, said liquid fuel being substantially methanol and comprising no substantial amount of water and comprising molecular oxygen in at most an insubstantial amount,

(b) providing catalytic reactor means, said catalytic reactor

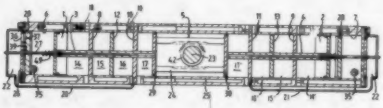
means containing a catalyst consisting essentially of manganese, copper and chromium,
(c) providing an internal combustion engine means,
(d) vaporizing said liquid fuel to form a vapor fuel,
(e) dissociating said vapor fuel in said catalytic reactor means to form a hydrogen rich gaseous fuel,
(f) mixing said hydrogen rich gaseous fuel with air to form a gaseous combustion mixture comprising hydrogen and oxygen,
(g) combusting said gaseous combustion mixture in said internal combustion engine means,
whereby methanol is dissociated to hydrogen which is then combusted in said internal combustion engine.

4,407,239
ROTARY ENGINE
Richard G. Wass, 781 Rancho Simi Dr., Covina, Calif. 91724
Filed Apr. 10, 1981, Ser. No. 252,847
Int. Cl.³ F02B 57/06
U.S. Cl. 123—44 C **9 Claims**



1. A rotary engine comprising:
a fixed engine housing having an internal chamber, said internal chamber having an inner wall, said internal chamber being cylindrical and having a longitudinal center axis;
a cylinder each end of which is open, said ends of said cylinder being located within said internal chamber in a close fitting manner, said cylinder being rotatable on a first axis of rotation relative to said fixed engine housing, said first axis of rotation coinciding with said longitudinal center axis of said fixed engine housing;
a primary output shaft attached to said cylinder and extending exteriorly of said fixed engine housing, the rotational axis of said primary output shaft coinciding with said first axis of rotation;
a pair of opposing pistons being movably mounted within said cylinder, said pair of opposing pistons being connected together about a connecting shaft assembly, said connecting shaft assembly extending exteriorly of said internal chamber and including an auxiliary power output shaft, said auxiliary power output shaft having a second axis of rotation, said second axis of rotation being spaced from said first axis of rotation, said connecting shaft assembly extending through an access opening assembly within said cylinder;
fuel/air mixture firing means mounted within said engine housing, each said end of said cylinder to be positionable directly adjacent said fuel/air mixture firing means;
an inlet port assembly including an interior chamber formed within said engine housing for conducting of a fuel/air mixture into said cylinder, said interior chamber being totally confined within said internal chamber and centrally disposed about said longitudinal center axis, said interior chamber being spaced from said inner wall; and
an outlet port assembly formed within said engine housing for discharging of exhaust gases from said cylinder.

4,407,240
OPPOSED PISTON INTERNAL COMBUSTION ENGINE WITH SPECIAL SCAVENGING MEANS
Bertram W. Fromson, Maison Des Landes S.B., Jersey, Channel Islands
PCT No. PCT/GB80/00016, § 371 Date Sep. 19, 1980, § 102(e) Date Sep. 19, 1980, PCT Pub. No. WO80/01588, PCT Pub. Date Aug. 7, 1980
PCT Filed Jan. 25, 1980, Ser. No. 199,726
Claims priority, application United Kingdom, Feb. 3, 1979, 7903864; Jul. 2, 1979, 7922896
Int. Cl.³ F02B 75/24, 75/28
U.S. Cl. 123—56 BC **14 Claims**



1. A reciprocating piston machine comprising a cylinder having a head at one end, a closing wall at the other end and a fixed partition therebetween defining a first pumping chamber with the closing wall, at least one main piston slidably mounted between the partition and the cylinder head and defining a combustion chamber with the cylinder head and a second pumping chamber with the fixed partition, a piston rod secured to said main piston and extending through said partition, at least one subsidiary piston secured to said piston rod within said first pumping chamber and slidable relative thereto conjointly with the movement of said main piston, said main piston having a compression stroke on movement toward said head and a power stroke on movement toward said closing wall said subsidiary piston having a compression stroke conjointly with the power stroke of said main piston, a scavenging piston freely disposed in the combustion chamber about at least one guide rod between the cylinder head and the main piston, said scavenging piston being in axial slidable engagement with said guide rod and the walls of said cylinder, means located about said guide rod for normally biasing said scavenging piston toward said cylinder head said at least one guide rod extending axially through said cylinder head, means for supplying a charge to said first and second pumping chambers for compression therein, conduit means from said pumping chambers to said combustion chamber for introducing the compressed charge into said combustion chamber between the cylinder head and the scavenging plate on the power stroke of said main piston, said compressed charge driving said scavenging plate towards the main piston to scavenge combustion, products from the combustion chamber and allow said combustion chamber to fill with compressed charge, said scavenging plate having valve means permitting return of the scavenging plate through the compressed charge in the combustion chamber on the compression stroke of said main piston.

4,407,241
EXPANDABLE HYDRAULIC TAPPET WITH A VARIABLE EXIT VALVE
Gordon K. Butler, Crothersville, and Don E. Beeson, Columbus, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.
Filed Dec. 31, 1980, Ser. No. 221,767
Int. Cl.³ F01L 1/24
U.S. Cl. 123—90.16 **20 Claims**

1. A pressure controlled expandable hydraulic tappet for use in an internal combustion engine to selectively vary the effective profile of a camshaft by extending the drive train between

said camshaft and a camshaft operated mechanism, said tappet comprising:

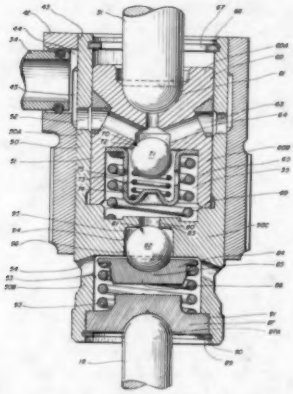
a housing having an internal piston receiving means;

expandable piston means reciprocally disposed within said housing, said piston means defining a load cell chamber having an inlet port and an exit port;

a supply of hydraulic fluid connected to said inlet port;

inlet valve means interposed said fluid supply and said chamber and biased to assume a closed position, said valve means opening to admit hydraulic fluid into said chamber expanding said piston means when a predetermined valve opening force is exerted on the upstream side of said valve means and said inlet valve means resuming a closed position and entrapping said fluid within said chamber when the valve closing force downstream of said valve means exceeds said valve opening force;

exit valve means connected to said exit port for selectively sealing or opening said chamber, said exit valve opening



to effect exiting of hydraulic fluid from said chamber at a predetermined rate when pressure within said chamber exceeds said predetermined amount, said exit valve means having flow throttling means within said tappet for controling the rate of closing of said exit valve and for controlling the flow rate at which fluid exits through said exit valve means, said exit valve means including an exit ball, a mating seat to accommodate in sealing relation said exit ball, and an exit valve counter-bore extending downstream from said seat, said exit valve counter-bore having a diameter slightly greater than the diameter of said exit ball, said exit ball being disposed for reciprocal movement substantially within said counter-bore and defining in combination with said counter-bore an annular passageway that limits the fluid flow rate therethrough; and

bias means for closing said exit valve and sealing hydraulic fluid within said chamber when the pressure within said chamber is below a predetermined amount.

4,407,242

VALVE SEATS

Alfred E. G. Blum, Greatford, England, assignor to Massey-Ferguson-Perkins Limited, London, England

PCT No. PCT/GB80/00137, § 371 Date May 8, 1981, § 102(e) Date May 4, 1981, PCT Pub. No. WO81/00737, PCT Pub. Date Mar. 19, 1981

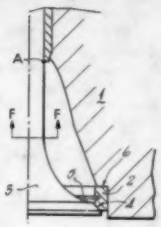
PCT Filed Sep. 8, 1980, Ser. No. 261,228

Claims priority, application United Kingdom, Sep. 8, 1979, 7931261

Int. Cl.³ F01L *3/22*

U.S. Cl. 123—188 S **12 Claims**

1. An engine valve seat comprising a body with an annular inner peripheral portion that carries a frusto-conical valve face adapted to be engaged by a valve member that is coaxial with and is movable along the axis of said frusto-conical valve face characterized in that said inner peripheral portion is cantilev-



ered over at least the full width of said valve face (4) as measured radially of said axis so that said valve face (4) is deflected in bending and shear when subject to valve gas and inertia seating forces.

4,407,243

AIR/FUEL RATIO CONTROL SYSTEM HAVING FUNCTION OF CONTROLLING SUPPLY OF SECONDARY AIR INTO INTAKE PIPE OF INTERNAL COMBUSTION ENGINE

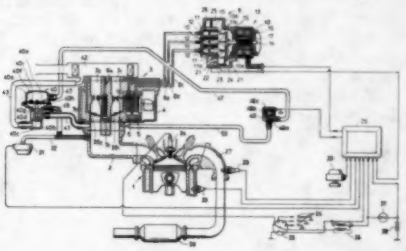
Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,464

Claims priority, application Japan, Aug. 27, 1980, 55-118879

Int. Cl.³ F02B *3/00, 33/00*

U.S. Cl. 123—179 G **2 Claims**



1. In an air/fuel ratio control system for performing feedback control of the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine having an intake pipe, the system including:

means for detecting the concentration of an exhaust gas ingredient emitted from said engine,

fuel quantity adjusting means for producing said mixture being supplied to said engine, and

an electrical circuit operatively connecting said concentration detecting means with said fuel quantity adjusting means in a manner effecting feedback control operation to control the air/fuel ratio of said mixture to a predetermined value in response to an output signal produced by said concentration detecting means,

said electrical circuit including a circuit for detecting the operating condition of said engine,

the combination which comprises:

a secondary air supply passage communicating said intake pipe of said engine with atmospheric air;

a secondary air control valve arranged across said secondary air supply passage and having a diaphragm defining a

negative pressure chamber on one side thereof and a control chamber on an opposite side thereof,

said secondary air control valve being responsive to negative pressure introduced into said negative pressure chamber to open said secondary air supply passage;

orifice means communicating said negative pressure chamber with said control chamber;

a check valve arranged to allow movement of air only from said negative pressure chamber to said control chamber;

a negative pressure passage communicating said negative pressure chamber with said intake pipe of said engine;

a control passage communicating said control chamber with said intake pipe to substantially instantaneously render said secondary air control valve inoperative by equalizing the pressures within the chambers thereof;

a solenoid valve arranged to close said control passage;

a sensor for detecting the rotational speed of said engine;

solenoid valve control means for controlling said solenoid valve in response to an output signal produced by said engine rotational speed sensor;

said solenoid valve control means including said engine operating condition detecting circuit,

said engine operating condition detecting circuit being arranged to be supplied with said output signal of said engine rotational speed sensor for control of the air/fuel ratio of said mixture;

said solenoid valve control means being operable to open said solenoid valve for a predetermined period of time after the rotational speed of said engine has increased across a predetermined value which is higher than the cranking speed of said engine but lower than the idling speed of said engine,

whereby said secondary air control valve is substantially instantaneously completely closed for said predetermined period of time upon opening of said solenoid valve.

4,407,244

APPARATUS FOR CONTROLLING THE PROPORTION OF AIR AND FUEL IN THE AIR-FUEL MIXTURE OF THE INTERNAL COMBUSTION ENGINE

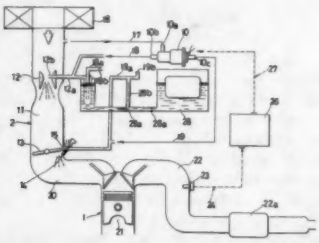
Motonobu Akagi, Kariya; Toshio Tanahashi, and Kichiro Kato, both of Susono, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 22, 1982, Ser. No. 390,890

Claims priority, application Japan, Jun. 27, 1981, 56-100110

Int. Cl.³ F02M *7/24, 23/04*

U.S. Cl. 123—339 **4 Claims**



1. An apparatus for controlling the proportion of air and fuel in the air-fuel mixture of an internal combustion engine having an intake manifold, a main system fuel passage and a slow system fuel tube, comprising:

a carburetor including an air horn tube having a venturi tube with a main nozzle and a throttle valve connected to the intake manifold of an internal combustion engine, said venturi tube having a main system fuel tube opening into said main nozzle at a first end thereof and communicating with a main system fuel passage through a second end thereof, said slow system fuel tube opening into a slow system fuel supply port formed near said throttle valve of the air horn tube at a first end thereof and communicating with said slow system fuel passage through a second end thereof, a main system air-bleeding passage connected to said main system fuel tube for supplying air thereto, and a slow system air-bleeding passage connected to said slow system fuel tube for supplying air thereto;

an electromagnetic control valve including a box-shaped housing formed with a magnetic material and provided with an air-inlet port, a first outlet port connected to said main system air-bleeding passage and an air-bleeding passage, a tubular iron core supported on said housing at opposite ends thereof, having a first passage and a second passage communicating with said first outlet port and with said second outlet port, respectively, and being formed separately with each other and internally of the iron core, at least one first valve opening formed in a part of the iron core provided with said first passage so as to allow communication between said first outlet port and said air-inlet port, and at least one second valve opening formed in a part of the core provided with said second passage so as to allow communication between said second outlet port and said air inlet port, a bobbin having a solenoid wound partially along the longitudinal length thereof and having a first valve element and a second valve element which are formed so as to open and close the at least one first valve opening and the at least one second valve opening, respectively, formed in said iron core, spring means urging said bobbin in a longitudinal direction of said iron core, and at least one pair of permanent magnets fixed to said housing at a position corresponding to said solenoid formed on said bobbin and so disposed that the direction of the magnetic flux is perpendicular to said solenoid; and

control means for applying analog electric signals to said solenoid, wherein the first valve element and the second valve element are in a positional relationship such that said first valve element starts opening said at least one first valve opening a predetermined time after said second valve element has started opening said at least one second valve opening when the bobbin is caused to slide on said iron core against the resilient force of said spring means due to application of said analog electric signals to said solenoid.

4,407,245

SHUTOFF APPARATUS FOR FUEL INJECTION PUMPS

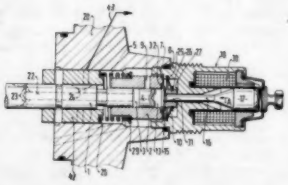
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,077

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3034605

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—359 **4 Claims**



1. A shutoff apparatus and/or overspeeding protection means for fuel injection pumps of internal combustion engines, said pump comprising a high-pressure portion connected with a low-pressure portion via an electromagnetically actuatable control device, a high pressure chamber controlled by a distribution piston and a displaceably supported annular cylinder, an electromagnet having a housing, said electromagnet including

actuation means arranged to engage said annular cylinder and axially aligned with said distribution piston, means slidably supported in said annular cylinder to seal said high-pressure chamber, said means slidably supported in said annular cylinder being arranged to be urged by a spring means against a stop on said housing, said annular cylinder including an axial bore which intersects a lateral means defining a slot, a pin in said slot arranged to engage said annular cylinder, said actuation means arranged to contact said pin, and said annular cylinder being normally held against a stop means by a compression spring, a normally closed relief bore in said annular cylinder located above said high-pressure chamber.

4,407,246

IGNITION SIGNAL GENERATING DEVICE FOR USE IN CONTACTLESS IGNITION SYSTEM

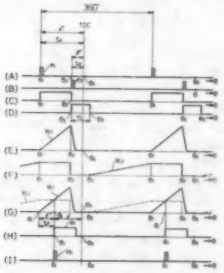
Kimihiro Boyama, Sunto, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Apr. 8, 1981, Ser. No. 252,055

Claims priority, application Japan, Apr. 11, 1980, 55-47780; Apr. 25, 1980, 55-55119

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—415 **6 Claims**



1. An ignition signal generating device for use in a contactless ignition system for an internal combustion engine comprising;

a first signal generating circuit to generate a first signal at a first position corresponding to the maximum advanced ignition position of said internal combustion engine;

a second signal generating circuit to generate a second signal at a second position corresponding to the minimum advanced ignition position of said internal combustion engine;

a first triangular wave generating circuit to generate a first triangular wave having a given inclination rising during the period from the first signal generating position to the second signal generating position;

a monostable multi-vibrator triggered by said second signal to generate a square wave signal of a given duration τ_1;

a second triangular wave generating circuit to generate a second triangular wave having a given inclination rising during the period from a falling position of an output signal of said monostable multi-vibrator at least to said first signal generating position with the maximum value of said triangular wave being maintained until said second signal is generated;

and an ignition signal generating circuit to produce an ignition signal to determine an ignition position of said internal combustion engine when the signal levels of said first and second triangular waves are equal to each other.

4,407,247

CLOSED LOOP TYPE AIR-FUEL RATIO CONTROL SYSTEM OF AN INTERNAL COMBUSTION ENGINE

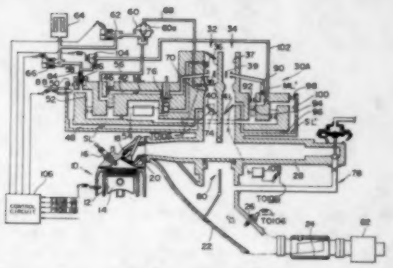
Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 21, 1981, Ser. No. 313,630

Claims priority, application Japan, Oct. 22, 1980, 55-147731

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—438 **6 Claims**



1. In an internal combustion engine having at its intake section a two-barrel type carburetor including a primary fuel supply system having a primary main fuel supply line and a primary slow fuel supply line and a secondary fuel supply system having a secondary main fuel supply line and a secondary step fuel supply line, and at its exhaust section a three-way catalytic converter disposed in an exhaust tube of said engine, a closed loop type air-fuel ratio control system comprising:

an exhaust gas sensor for producing an information signal representative of the air-fuel ratio of the engine inlet mixture by sensing the engine exhaust gas;

a control unit for producing a command signal by processing said information signal issued from said exhaust gas sensor;

first means for controlling the amount of air fed to said primary main fuel supply line in accordance with the command signal from said control unit;

second means having first and second conditions which take place selectively, said first condition being a condition wherein said second means controls the amount of air fed to said primary slow fuel supply line in accordance with the command signal from said control unit, said second condition being a condition wherein said second means controls the amount of air fed to either of said secondary main fuel supply line and said secondary step fuel supply line in accordance with the command signal from said control unit, and

third means for causing said second means to assume selectively said first and second conditions in accordance with the load applied to the engine.

4,407,248

ELECTRONICALLY CONTROLLED CARBURETOR

Yuzo Takeuchi, Nagoya; Toshihide Kimura, Aichi, and Shigetaka Takada, Obu, all of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Jan. 20, 1982, Ser. No. 341,087

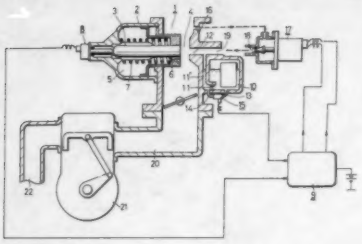
Claims priority, application Japan, Jan. 26, 1981, 56-10495

Int. Cl.³ F02B *33/00*; F02M *7/00*

U.S. Cl. 123—439 **3 Claims**

1. An electronically controlled carburetor for an internal combustion engine for a vehicle comprising a variable venturi for varying the venturi cross-section and concurrently varying the amount of air metered into said venturi in response to the engine operating conditions, an air flow sensor for sensing the displacement of said variable venturi and producing related electrical signals in response to changes in air flow through said venturi, a main fuel nozzle for discharging metered fuel

into said venturi, a fuel flow sensor for sensing pressure differential of fuel across a main fuel jet communicating with said main fuel nozzle, said fuel flow sensor producing related electrical signals in response to changes in fuel flow through said main fuel jet, an air bleed controlling actuator for controlling



the amount of air to be bled into said main fuel nozzle, and a control circuit responsive to the output signals from said air flow sensor and said fuel flow sensor for driving said air bleed controlling actuator, whereby the amount of air bleed may be controlled so as to set the ratio of air-to-fuel at an arbitrary fixed value at all times.

4,407,249

FUEL INJECTION PUMP FOR SELF-IGNITING INTERNAL COMBUSTION ENGINES

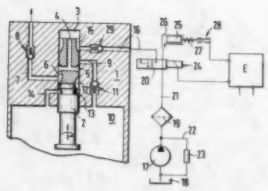
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 6, 1981, Ser. No. 260,957

Claims priority, application Fed. Rep. of Germany, May 6, 1980, 2017275

Int. Cl.³ F02M *41/00*

U.S. Cl. 123—449 **6 Claims**



1. A fuel injection pump for a self-igniting internal combustion engine having a pump work chamber, said pump further having at least one metering piston functioning synchronously with the engine for determining a metered injection quantity, said pump further having a distributor driven synchronously with at least one pump piston, said distributor delivering said metered injection quantity to a work chamber during an intake stroke of said pump piston and to injection lines leading to the engine during a compression stroke of said pump piston, characterized in that said at least one metering piston confining volume of metered fuel is preferably disposed upstream of said distributor, said metering piston is actuated for its metering movement by a controlled fuel flow to said volume and is actuated for its displacement movement of the metered fuel to be fed into said pump work chamber by a controlled release of a restoring force means and further that the stroke of said metering piston is determined by electrical means, said electrical means being triggered by a control device whereby the metered injection quantity is determined, said electrical means comprising a travel transducer and a magnetic valve associated with said metering piston, and magnetic valve having a first position during the compression stroke when fuel is supplied from a supply pump to said metering piston and a second position at which a connection leading from the metered volume ahead of said metering piston to said pump work chamber is opened upon completion of the metering stroke of the metering piston, the connection being further controlled by a control edge of said pump piston and opened during the intake stroke when said metered injection quantity driven by the restoring force means is supplied to said work chamber.

4,407,250

FUEL INJECTION SYSTEM

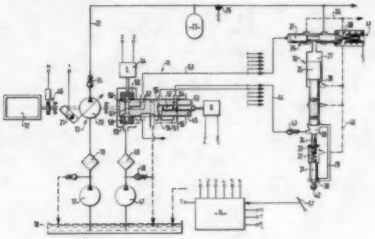
Franz Eheim, Stuttgart; Gerald Höfer, Weissach-Flacht, and Heins Links, Baiersbronn, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 15, 1981, Ser. No. 225,166

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001166

Int. Cl.³ F02M *41/06*; F02D *1/02*

U.S. Cl. 123—450 **30 Claims**



1. A fuel injection system for internal combustion engines comprising a plurality of pump nozzles and a high pressure servo fluid source;

each said pump/nozzle including a servo piston, said servo piston including a large diameter portion and a small diameter portion serving as a pump piston, a pump work chamber below said small diameter portion and a servo pressure chamber above said large diameter portion, said servo pressure chamber receiving via a servo pressure line servo fluid from said high pressure servo fluid source for driving said servo piston;

a control apparatus for injection onset arranged to control the flow of servo fluid from said high pressure source to said servo pressure chamber for driving said servo piston in proportion with the cycles of the engine;

and a fuel metering apparatus arranged to determine the fuel quantity of the fuel to be injected and storing up said fuel in said pump work chamber below said pump piston;

said control apparatus and said fuel metering apparatus being driven by a common drive means and combined into a common structural unit comprising a single rotating distributor means;

said fuel metering apparatus comprising a variable stroke metering piston provided with a supply chamber which is alternatively connected via the distributor means with the fuel source and with a pump work chamber.

4,407,251

FUEL-SUPPLY CONTROL SYSTEM

Keiichi Nakanishi, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Aug. 4, 1981, Ser. No. 290,075

Claims priority, application Japan, Oct. 17, 1980, 55-144458

Int. Cl.³ F02B *33/00*, *3/00*

U.S. Cl. 123—472 **17 Claims**

1. A fuel supply control system for an engine comprising:

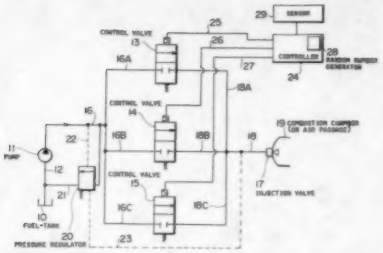
(a) a fuel supply line to supply fuel to the engine;

(b) at least two control valves arranged in the fuel supply line, the control valves being connected in parallel with

each other and changing between open and closed states when energized by drive pulses;

(c) a sensor for detecting an engine operating condition and producing an output signal indicative thereof;

(d) a generator producing signals corresponding to a random designation sequence for designating the control valves in a random sequence, the number of the different signals equal to the number of the control valves; and



(e) a controller responsive to the output signal of the sensor for generating said drive pulses, the duty cycle of the drive pulses variable with the engine operating condition, said controller operative for distributing each of said drive pulses to a random one of the control valves designated by the random designation signals of the generator to open the designated control valve so that the control valves are opened in a random sequence.

4,407,252

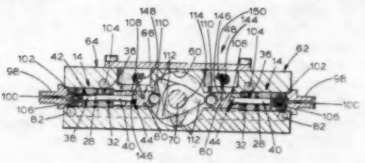
FUEL INJECTION SYSTEM

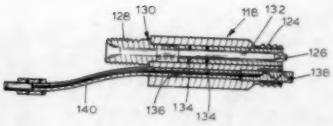
Monte M. Dilliner, Lineville, Iowa, assignor to Oscar E. Jones; Ted Lowe, both of Des Moines, Iowa and Robert H. Robinson, Fairfield, Ill., a part interest

Filed Jun. 4, 1981, Ser. No. 270,639

Int. Cl.³ F02M *59/30, 61/18*

U.S. Cl. 123—504 **17 Claims**





1. A fuel injection system for an internal combustion engine having a cylinder and a combustion chamber therefor, an access port to said combustion chamber, a source of fuel supply, a fuel conduit connected to said source of supply and a means for supplying fuel from said source of supply to said fuel conduit, said system comprising:

a pump body having a through bore defining a first and second end,

a high pressure seal mounted in said body at a predetermined point spaced inwardly from said first end to define a fuel receiving chamber,

a low pressure seal mounted in said body intermediate said second end and said high pressure seal,

a plunger having a metering end and a drivable end and journalled through and supported in said seals free of contact with said pump body and reciprocable relative thereto in a working stroke with the metering end of said plunger designed to move in said chamber between said high pressure seal and said first end,

each of said seals being of a material having low friction properties so that said plunger in reciprocation requires no lubrication from the fuel pumped or from other sources,

a valved fuel inlet line to said chamber connected to said fuel conduit,

a fuel injector mounted in the access port to said combustion chamber, said injector comprising:

a body member provided with a through fuel passageway,

an adjustable spring loaded nozzle assembly in said passageway supported in spaced seal members free of contact with said body member, and

said seal members being of a material having low friction properties so that said nozzle assembly in operation requires no lubrication from the fuel pumped or from other sources,

a valved fuel outlet line from said chamber to said injector, and

means for acting against the drivable end of said plunger to vary the length of stroke thereof for ejecting selectively varied precise amounts of fuel through said outlet line to said injector at a rate proportional to desired engine speeds.

4,407,253

FUEL INJECTION PUMP FOR SELF-IGNITING INTERNAL COMBUSTION ENGINES

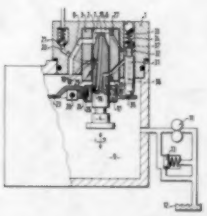
Manfred Bauer, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,445

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013087

Int. Cl.³ F02M *37/04*

U.S. Cl. 123—506 **16 Claims**



1. In a fuel injection pump for supplying fuel to injection nozzles of self-igniting internal combustion engines, having: housing means within which a bore and a suction chamber are defined; a pump piston mounted for reciprocating movement within the bore as a function of engine rpm, said housing means and piston defining a pump work chamber in said bore, a plurality of pressure lines, each adapted to be connected at one end to the housing means for communicating with the work chamber and at the other end to an injection nozzle, and a fuel injection quantity control device for changing the fuel quantity delivered by said fuel injection pump into said pressure lines as a function of engine parameters, the improvement comprising:

a relief conduit containing a throttle, the relief conduit being connected to the work chamber and to the suction chamber for passage therethrough of a partial fuel quantity during a part of the compression stroke of the piston,

said relief conduit being controlled by at least one control edge of the piston and a control element actuated by said fuel injection quantity control device both arranged in line to one another for delivery of the partial fuel quantity to the suction chamber, when the piston has executed a predetermined pre-stroke of its compression stroke, during which time the remaining fuel has reached the injection pressure, and

a control slide further controlling the cross section of said relief conduit in line to said control edge and said control element to selectively block or throttle the fuel flow through said relief conduit.

4,407,254

INTAKE HEATING APPARATUS OF AN INTERNAL COMBUSTION ENGINE

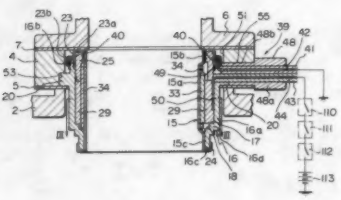
Keigo Kato, and Yosio Kuroiwa, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

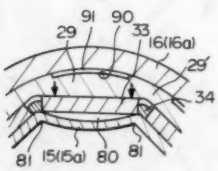
Filed Jan. 27, 1982, Ser. No. 343,342

Claims priority, application Japan, Oct. 5, 1981, 56-157535; Oct. 5, 1981, 56-157537

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—549 **9 Claims**





1. An intake heating apparatus of an internal combustion engine comprising a hollow heater vessel, which is placed in an intake passage between a fuel supply means and a cylinder of the engine to heat an intake, said hollow heater vessel comprising: an inner pipe having therein a mixture passage which is aligned with the intake passage; an outer pipe in which said inner pipe is press-fitted; a plurality of periphery spaced PTC elements located between said inner pipe and said outer pipe; and an annular elastic electrode which is connected to an external electrical power supply and is located between the PTC elements and the outer pipe, so that the electrode comes into contact with the PTC elements, whereby the inner pipe is heated by heating the PTC elements to heat the intake passing through the heater vessel, wherein the improvement comprises means for preventing the PTC elements from being broken when and after the inner pipe is press-fitted in the outer pipe.

4,407,255

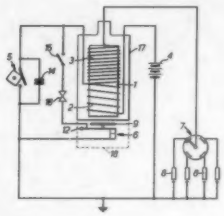
APPARATUS FOR SUPPLYING HIGH VOLTAGE PULSES

James G. Butler, 2, Station Ter., Penarth, Glamorgan, Wales

Filed Jul. 14, 1980, Ser. No. 168,087

Int. Cl.³ F02P *3/02*

U.S. Cl. 123—595 **10 Claims**



1. A retrofit ignition conversion apparatus for backfitting a conventional non-vibrator ignition transformer (17) equipped with a magnetically transparent housing-end for supplemental operation as a vibrator type ignition transformer for supplying a continuous stream of high-voltage pulses from said ignition transformer (17) secondary coil (3) comprising:

(a) a contact breaker (5) connected to a primary winding (2),

(b) a means (15) for connecting a voltage source (4) to said primary winding (2),

(c) said means (15) constituting an isolating switch,

(d) a vibrator switch (6) adapted to be physically mounted (18) to said conventional ignition transformer (17) and electrically connected to said primary winding (2), said vibrator switch (6) being normally biased closed under mechanically elastic pressure inherent in many such known vibrator switch structures,

(e) a magnetically attractive means (9) associated with said vibrator switch (6) and disposed outside said conventional transformer (17) casing in sufficient proximity to the transformer case end to insure functional magnetic coupling with said magnetically attractive means (9) such that said vibrator switch (6) will be caused to move to an open condition against said elastic closing bias when a magnetic field passes through the transformer core whereby when said switch (6) and said primary winding (2) are connected to a voltage source (4), the opening and closing of said switch (6) will result in a stream of high voltage pulses from said ignition transformer (17) secondary winding (3),

(f) said retrofit apparatus further comprising said contact breaker (5) connected in parallel with the series combination of said isolating switch (15) and said vibrator switch (6) such that when said isolating switch (15) is opened, said conventional ignition transformer will operate independently of said retrofit system.

4,407,256

CAPACITOR DISCHARGE IGNITION SYSTEM AND METHOD OF MANUFACTURE THEREOF

Ronald J. Wolf, Zanesville, Ind., assignor to Wabash, Inc., Wabash, Ind.

Division of Ser. No. 171,705, Jul. 24, 1980, Pat. No. 4,333,442, and a continuation-in-part of Ser. No. 105,234, Dec. 19, 1979, abandoned. This application Nov. 18, 1981, Ser. No. 322,405

Int. Cl.³ F02P *1/00*

U.S. Cl. 123—599 **9 Claims**

1. In a capacitor discharge ignition system for use with and positioned adjacent a flywheel having two permanent magnets rotated in synchronism with the operation of a two cylinder engine, a capacitor discharge ignition sub-assembly for mounting on a ferromagnetic core, the capacitor discharge ignition sub-assembly comprising:

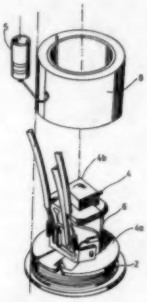
an auxiliary coil;

an ignition transformer including a primary coil and two secondary coils;

a coil support member, said auxiliary coil and said primary and second coils being concentrically disposed on said coil support member about a common axis;

electrical circuitry means interconnecting said auxiliary coil and said primary coil and being responsive to said auxiliary coil for providing energy to said primary coil in response to induced electrical energy in said auxiliary coil as a result of the rotating magnetic field; and

a housing for receiving and enclosing said auxiliary coil, said ignition coil and said circuitry means, said auxiliary coil



being disposed about a first portion of said coil support member, said ignition transformer being disposed about a second portion of said coil support member adjacent said first portion and said electrical circuitry means being disposed about said auxiliary coil and between said auxiliary coil and said housing,

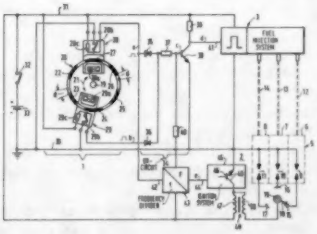
said primary coil being disposed directly about said second portion of said coil support member and said two secondary coils being disposed one atop the other and about said primary coil, said primary coil being contiguous with the entirety of one of said secondary coils and contiguous with a predetermined portion of the second of said secondary coils.

4,407,257

METHOD AND APPARATUS FOR CONTROLLING AN IGNITION SYSTEM

Darwin O. Taft, Bainbridge, and Howard E. Van Siclen, Jr., Sidney, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 17, 1981, Ser. No. 331,866
Int. Cl.³ F02P *7/00*
U.S. Cl. 123—612 **16 Claims**



1. A method of controlling an ignition system for an internal combustion engine, said ignition system of the type having means for generating electrical energy, means for storing electrical energy, a plurality of spark plugs, and means for distributing and discharging said stored electrical energy to each of said spark plugs in timed relation to the operating cycle of said engine, said distributing and discharging means including a plurality of switching devices equal to the number of spark plugs, each device operatively connected to a respective spark plug and an electromagnetic pulse generator for generating electric pulses in timed relation to the operating cycle of the engine, each pulse adapted to operate a respective switching device in timed relation to the operating cycle of the engine, the method comprising:

generating with said electromagnetic pulse generating means and for each operating cycle of the engine a number of trigger pulses greater than the number of spark plugs; and

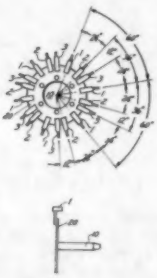
distributing only the number of trigger pulses equal to the number of spark plugs to a respective switching device for each operating cycle of the engine to permit discharge of said stored energy through each of said spark plugs in timed relation to the operating cycle of the engine.

4,407,258

IGNITION AND FUEL INJECTION PULSE GENERATING SYSTEM FOR ODD-NUMBERED MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Walter Ruf, Schieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,460
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045716
Int. Cl.³ F02P *5/00*
U.S. Cl. 123—617 **5 Claims**



1. For combination with an internal combustion engine (**5**) having an odd number of cylinders,

a control pulse generating system to provide

(a) ignition control pulses for spark plugs (**9, 10, 11**) of the engine (**5**), and

(b) fuel injection control pulses for a fuel injection system (**3**),

in which a larger number of ignition control pulses (**U44**) than fuel injection pulses (**U41**) are required for application to the engine, and the timing of said ignition control pulses and of said fuel injection pulses is different,

said control pulse generating system having a drive shaft (**19**) coupled to the engine (**5**) rotating in synchronism therewith at half engine speed,

and comprising, in accordance with the invention,

a signal generator (**1**) including

a rotor (**20**) having a plurality of blocking vane or gate portions (**22, 23, 24, 25, 26, 27**) separated by vane gaps or openings,

a first signal generator unit (**28**) and a second signal generator unit (**29**), each unit being positioned to be selectively covered by the vanes or gates, or left uncovered by the vane gaps or intervening openings, and generating pulses (**U28, U29**) corresponding to coverage of the respective generator unit by said vane;

wherein the number of vanes is twice the number of cylinders of the engine (**5**);

the position, and the dimension, and the rotation of the rotor, relative to the generators, are so arranged and selected that the first pulses (U28) generated by the first generator (28) extend over the pulse gaps of the second pulses (U29) from the second generator (29);

at least one vane (23, 26) having its leading edge—with respect to the direction of rotation of the rotor—foreshortened by a dimension (d) so that the pulse generated by the first signal generator (28), upon passage of the foreshortened vane or gate (23, 26) commences only when part of the pulse gap of the second generator (29) has already elapsed;

an OR-function gate (34), having the first and second pulses from the first and second pulse generator (28, 29) applied thereto and providing said fuel injection control pulses (U41) as a function of the overlap of the pulse gaps of the pulses applied to the OR-function gate (34);

and circuit means (42, 43) responsive to the trailing flanks of the pulses from one (28) of said pulse generators (28, 29) for providing said ignition control pulses (U44).

4,407,259

PLASMA IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

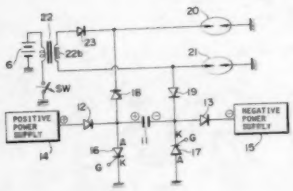
Toshimi Abo, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1981, Ser. No. 333,748

Claims priority, application Japan, Jan. 8, 1981, 56-764

Int. Cl.³ F02P *3/08*

U.S. Cl. 123—620 **16 Claims**



1. A plasma ignition system for an internal combustion engine having a plurality of plasma ignition plugs and comprising:

(a) a first means for generating a high DC voltage surge immediately before every ignition timing, said means operative for generating a spark discharge at each plasma ignition plug connected thereto;

(b) a capacitor;

(c) a second means for charging a plasma ignition energy into said capacitor;

(d) a third means for generating a first trigger signal at every ignition timing;

(e) a pair of electrical switching elements, each connected between either end of said capacitor and ground, each said switching element operative for grounding the corresponding end of said capacitor upon receipt of said first trigger signal from said third means; and

(f) a fourth means, connected between both ends of said capacitor and the plasma ignition plugs, for providing a discharge path of said capacitor through one of the plasma ignition plugs where the spark discharge has occurred whereby plasma ignition is established in said plugs.

4,407,260

ARCHERY BOWSTRING RELEASE DEVICE

Leon W. Lyons, 1122 Dewitt Ave., Niles, Mich. 49120

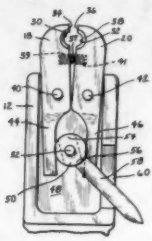
Division of Ser. No. 62,701, Aug. 1, 1979, Pat. No. 4,282,851.

This application Nov. 24, 1980, Ser. No. 210,121

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—35 A **3 Claims**

1. An archery bowstring release device comprising a housing, jaws pivoted intermediate their ends to said housing and having ends projecting from said housing and said ends provided with confronting string-receiving notches, spring means normally separating the projecting ends of said jaws, said jaws being shiftable between a string-retaining position and a string-releasing position, each of said jaws including an elongated leg within the housing, and manually shiftable means pivotally connected to said housing and having a part projecting from



said housing, said shiftable means including a member having radial projections positioned between and engaging said jaws in a string retaining first position during bowstring drawing and aiming, said member being pivotable to a second position upon rotation of said shiftable means to disengage said radial projections from the jaws whereby said projecting string-engaging jaw ends may be spring-released and separated.

4,407,261

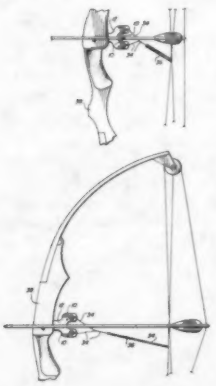
ARROW LOCK

Kenneth L. Elliott, 2101 W. Detroit, Chandler, Ariz. 85224

Filed Dec. 24, 1981, Ser. No. 334,447

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—41 A **7 Claims**



1. An arrow lock for mounting on a compound bow, comprising:

a Y-shaped mounting plate having a mounting leg and first and second prong members;

first and second shaft members protruding through said first and second prong members and mounted for rotation therein;

first and second retaining flaps coupled to said first and second shaft members, respectively, each of said flaps having an adjacent edge into which a semicircular notch is cut to define a circular region which secures an arrow when said flaps are closed;

first means coupled to said first and second shaft means for biasing said flaps closed; and

second means coupled to said first and second shaft means for overcoming said biasing means when said bow is drawn causing said flaps to open and release said arrow.

4,407,262

WAFER DICING APPARATUS

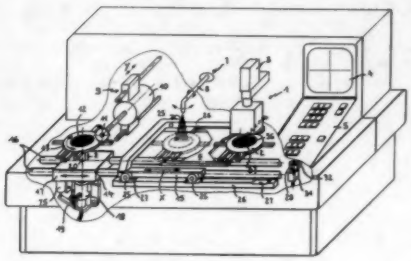
Gustav Wirz, Berg, and Franco Pizzagalli, La Chaux-de-Fonds, both of Switzerland, assignors to Les Fabriques d'Assortiments Reunies S.A., Le Locle, Switzerland

Filed Mar. 2, 1981, Ser. No. 239,681

Claims priority, application Switzerland, Mar. 10, 1980, 1853/80

Int. Cl.³ B28D 1/04

U.S. Cl. 125—13 R 28 Claims



1. An installation for the sawing of plate materials, so as to form a plurality of elementary platelets, comprising:

an alignment station where the plates are provided with a predetermined orientation;

a sawing station where the plates are sawed into a plurality of elementary platelets;

a cleaning station where the sawed plates are subjected to the action of a cleaning agent; and

a handling device to convey each plate to successive stations of the installation,

said handling device comprising:

at least two independent platforms for receiving the plate and maintaining it in an orientation that is predetermined in relation to said platform;

a first transfer means for successively conveying each platform equipped with a plate at the alignment station to the sawing station, while maintaining the plate's precise orientation;

said first transfer means supporting and orientating said plate properly during the cutting operation and then conveying and depositing said plate at the cleaning station; and

a second transfer means taking each platform at the cleaning station and conveying said each platform to the alignment station to deposit it there;

said handling device comprising means such that sawing of one plate may be carried out during the cleaning of a preceding plate or during alignment of a subsequent plate.

4,407,263

CUTTING BLADE

Yasunori Murata, Nara, Japan, assignor to Diamond Giken Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,338

Int. Cl.³ B28D 1/04

U.S. Cl. 125—15 13 Claims

1. A cutting blade comprising a base plate formed with a plurality of grooves in both sides thereof, said grooves having a depth being at least half of the thickness of said base plate, abrasive grains affixed to said base plate in said grooves and further grains affixed to the surface of the base plate at spaced

locations midway of each pair of adjoining grooves in both sides of the base plate.

4,407,264

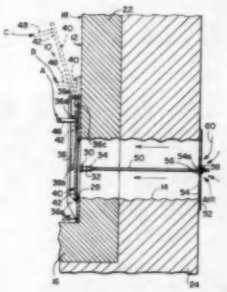
ADJUSTABLE FRESH AIR DAMPER FOR COMBUSTION

Arthur J. Pettorino, 9 Wilshire Dr., Syosset, N.Y. 11791

Filed Dec. 2, 1981, Ser. No. 326,538

Int. Cl.³ F24B 1/18

U.S. Cl. 126—120 3 Claims



1. An adjustable fresh air damper for combustion which comprises:

(a) a front place having a central aperture;

(b) an air intake plate having a plurality to apertures;

(c) a means for holding said front plate against a firebrick inner wall and said air intake plate against an outer wall of a rear wall of a fireplace having an aperture therethrough, said means comprising:

(1) a cross bar with a central boss having a threaded aperture perpendicular to the long axis of said cross bar and facing rearward with each end of said cross bar affixed to said front plate across said central aperture;

(2) a rod with a threaded end placed into said threaded aperture of said central boss of said cross bar and a second threaded end placed through said middle aperture to said air intake plate;

(3) a washer placed onto said second threaded end of said rod; and

(4) a nut threaded onto said second threaded end of said rod;

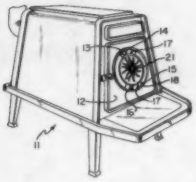
(d) a slide door that is gravity operated; and

(e) a means for guiding said slide door, affixed to said front plate, so that said slide door can go to an up position exposing said central aperture in said front plate allowing ambient outside fresh air to enter said fireplace and said slide door can go to a down position covering said central aperture in said front plate preventing ambient outside fresh air to enter said fireplace.

4,407,265
WOOD STOVE AIR FLOW REGULATING

Paul E. Brefka, Southborough, Mass., assignor to Energy Harvesters Corporstion, Fitzwilliam, N.H.

Filed Dec. 11, 1978, Ser. No. 968,288
Int. Cl.³ F23M 7/00
U.S. Cl. 126—193 7 Claims



1. In a wood stove door air flow regulating apparatus comprising,

primary and secondary air regulating door means for selectively controlling the flow of air through said door,

and baffle means secured to the inside of said door for coacting therewith to define an air channel while obstructing sparks in the stove combination chamber from exiting through an air inlet in said door selectively covered by said door means,

said door means comprising sectoral plates corresponding substantially to a sector of a circle with each of said plates formed with an opening for accommodating an element about which a plate pivots and a significantly larger opening radially outward therefrom,

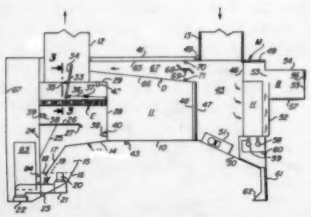
at least one of said plates being formed with a stepped portion so that said plates may be mounted in partial overlapping relationship with the radially outwardmost portions thereof being in a common plane,

said plates being mounted in said baffle means and said baffle means being formed with angularly spaced radial protrusions for supporting said radially outwardmost portions of said plates.

4,407,266
METHOD OF AND APPARATUS FOR EXHAUST CONTROL AND SUPPLYING TEMPERED MAKEUP AIR FOR A GREASE EXTRACTION VENTILATOR

Victor D. Molitor, Denver, Colo., assignor to Molitor Industries, Inc., Englewood, Colo.

Filed Jul. 24, 1981, Ser. No. 286,616
Int. Cl.³ F24C 15/20
U.S. Cl. 126—299 D 24 Claims



1. A method of supplying tempered makeup air to a room in conjunction with a grease extraction ventilator disposed above cooking equipment in said room and having removal means for removing grease and smoke particles and the like from air mixed with products of cooking, which comprises:

causing heated air and products of cooking from said cooking equipment to pass through said removal means of said grease extraction ventilator;

removing said heated air and remaining products of cooking, after passage through said removal means, through a discharge duct;

conducting fresh air through an intake duct to heat exchange means for tempering the same;

discharging the tempered fresh air into said room;

establishing a source of incoming air;

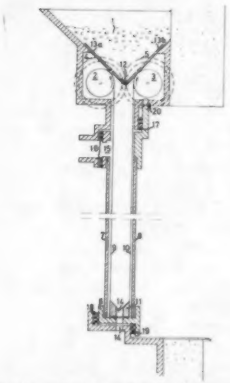
passing incoming air to said discharge duct inversely in accordance with the temperature of said heated air and products of cooking; and

causing incoming air, which is not passed to said discharge duct, to become a portion of said tempered air for discharge into said room.

4,407,267
METHOD OF REGULATING RADIATION THROUGH WINDOWS

Carl G. Heden, Solna Kyrkväg 11, S-17164 Solna, Sweden

Filed Jul. 9, 1981, Ser. No. 281,705
Claims priority, application Sweden, Jul. 14, 1980, 8005141
Int. Cl.³ F24J 3/02
U.S. Cl. 126—419 5 Claims



1. A method of regulating radiation through double-glazed closures comprising a pair of spaced parallel transparent panes, comprising lowering between the panes a bag of small discrete bodies of porous insulating material with the bag extending at least most of the height of the panes, when it is desired to decrease radiation through the closure, and raising said bag from between the panes when it is desired to increase radiation through the closure.

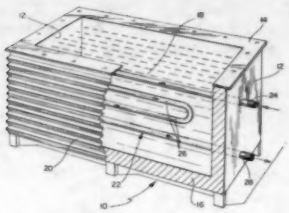
4,407,268
SOLAR FURNACE

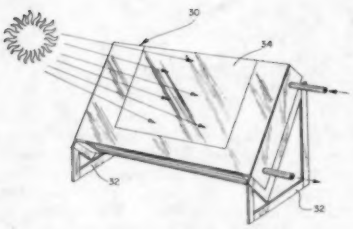
Albert C. Jardin, 170 Old Mill Blvd., Warwick, R.I. 02889

Division of Ser. No. 136,896, Apr. 3, 1980, Pat. No. 4,326,501.
This application Jan. 21, 1982, Ser. No. 341,257
Int. Cl.³ F24J 3/02
U.S. Cl. 126—430 3 Claims

1. A solar furnace comprising a watertight tank capable of storing phase change material that changes from solid to semi-solid to liquid form, thickly insulated walls all but one wall of said tank, said one wall being a metallic wall that is exposed to permit solar radiation to be absorbed therethrough directly to said phase change material, said tank having a conduit through one of its outer walls and into and through said phase change material for passing a liquid into and out of said tank, said tank

being mounted on a support outside the building for holding the tank at an angle to the horizontal so that the plate will be





at an angle substantially equal to the latitude of installation plus ten degrees.

4,407,269

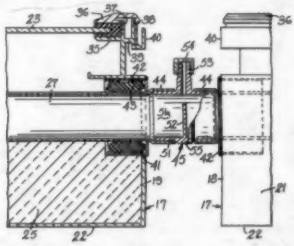
SOLAR ENERGY COLLECTOR SYSTEM HAVING BALANCED HEAT-EXCHANGE FLUID FLOW

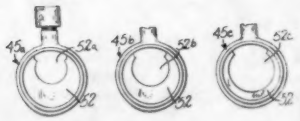
Thomas P. Hopper, Durham, Conn., assignor to Sunsearch, Inc., Guilford, Conn.

Continuation of Ser. No. 922,751, Jul. 7, 1978, abandoned. This application Jan. 22, 1981, Ser. No. 227,195

Int. Cl.³ F24J *3/02;* **F16L** *27/04;* **D03D** *39/00;* **F28F** *9/02*

U.S. Cl. 126—442 **10 Claims**





1. An array of solar collectors of the liquid heat-exchange type where each collector comprises spaced-apart first and second headers with conduits extending therebetween, the headers of said collectors being connected in header lines so that heat-exchange fluid introduced into said first header flows through said first header line and said conduits to said second header line and exits therefrom, the fluid input being to one end of said first header line and the output from the other end of said header line, means connecting said headers to form said header lines, said connecting means comprising at least in part coupling members defining a passage therethrough, said coupling members having two ends, each end adapted to be coupled to a header, means in said coupling means intermediate said ends defining a flow restricting orifice, the orifices of said coupling members in the input header line being of progressively decreasing area from the input end, and the orifices of coupling members in said output line being of progressively increasing area from the first collector to balance the flow of liquid passing through said collectors.

4,407,270

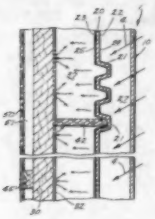
SOLAR COLLECTOR

Kenneth A. Riedel, 1601 W. Salem, Indianola, Iowa 50125

Filed Jun. 4, 1981, Ser. No. 270,222

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 **1 Claim**



1. A solar collector, comprising:

a. an external frame;

b. an internal frame installed within said external frame, said internal frame being constructed from a rigid, thermally insulating material;

c. an opaque collector plate means for preventing light rays from passing therethrough frictionally received within a groove formed on the inside surface of the internal frame, said collector plate having corrugations and said rear surface of said collector plate including textured surface means for helping to cause non-laminar flow of air through said heat transfer chamber;

d. an insulated reflective means installed within said external frame below said collector plate in a spaced apart relationship for receiving heat energy rays from said collector plate for reflecting said heat energy rays back toward said collector plate;

e. a translucent collector cover secured to said external frame above said collector plate in a spaced apart relationship with regard thereto;

f. a heat transfer means including a chamber formed between said collector plate and said reflective member and bounded by said thermally insulating internal frame, said heat transfer chamber being between 1¼ inches and 2¾ inches in width, for helping to cause non-laminar flow of air through said heat transfer chamber and wherein the rear surface of said collector plate has a heat emittive, non-selective coating thereon, and said heat transfer chamber is formed between said rear surface and a reflective surface provided on said reflecting means whereby *said non-selective coating will readily release heat energy* to the air in said heat transfer chamber;

g. a heat transfer means for transferring heat from said heat transfer chamber, said heat transfer means comprising means for creating airflow through said heat transfer chamber, said heat transfer chamber having an air inlet and an air outlet and a means for forcing air through said heat transfer chamber from said inlet to said outlet;

h. a plurality of baffles disposed in said heat transfer chamber for directing said airflow in a circuitous path from said inlet to said outlet;

i. uneven baffle spacing means for helping to cause non-laminar flow of air through said heat transfer chamber wherein said baffles are unevenly spaced along said heat transfer chamber; and

j. a first dead air space between said collector plate and said collector cover, and a second dead air space means, including a backing member secured to the rear of said external frame in a spaced apart relationship with respect to said reflective member, for forming a second dead air space between said backing member and the rear side of said reflective member, wherein said exterior frame encloses said first and second dead air spaces and said heat transfer chamber, whereby said heat transfer chamber is sandwiched between first and second dead air spaces.

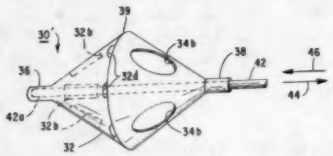
4,407,271
APPARATUS FOR LEFT HEART ASSIST

Peter Schiff, Rte. 7, Cookeville, Tenn. 38501

Continuation-in-part of Ser. No. 172,753, Jul. 28, 1980, abandoned. This application May 26, 1981, Ser. No. 267,374

Int. Cl.³ A61N *1/03*

U.S. Cl. 128—1 D **24 Claims**



1. An assist device for insertion through a body vessel into the region of the aortic arch to assist in the pumping function of the heart comprising:

a flexible elongated cable member having a distal end extending into the artery and having a proximal end extending outside of the body and being adapted to move said distal end when said proximal end is moved;

a non-occlusive umbrella assembly mounted upon said cable member in proximity to said distal end and comprising a hollow collapsible shell incorporating means for normally urging said shell toward the open position, the resilience of said means being chosen to enable movement of said shell to a collapsed position as fluid flows in a first direction against said shell, said shell being adapted to be retained in the open position responsive to fluid flow in a direction opposite said first direction, said shell, when in the open position, being linearly moveable, and non-occlusive, relative to said vessel, to perform a pumping operation and yet to prevent the occurrence of clotting.

4,407,272
ENDOSCOPE SYSTEM WITH MEANS FOR DETECTING AUXILIARY APPARATUSES

Tatuya Yamaguchi, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1981, Ser. No. 307,306

Claims priority, application Japan, Oct. 8, 1980, 55/140992

Int. Cl.³ A61B *1/06*

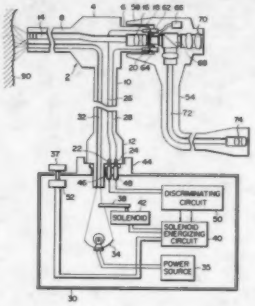
U.S. Cl. 128—6 **11 Claims**

1. An endoscope system comprising:

an endoscope including a light guide for transmitting an illumination light, an image guide for transmitting light reflected by a region of interest on which the illumination light from the light guide is projected, and a viewing section for viewing an image of the region of interest transmitted through the image guide;

a light source for supplying illumination light to said light guide of said endoscope;

an auxiliary apparatus capable of being removably attached to said viewing section of said endoscope; and



detecting means for detecting the attachment of an auxiliary apparatus and the kind of said auxiliary apparatus attached to said viewing section of said endoscope and including means for setting the intensity of light fed into said light guide of said endoscope in accordance with the detected attachment of an auxiliary apparatus and as a function of the detected kind of said attached auxiliary apparatus.

4,407,273
RAISING MEANS FOR GUIDING AN IMPLEMENT OF AN ENDOSCOPE

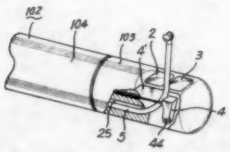
Teruo Ouchi, Kawagoe, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Japan

Filed Feb. 23, 1982, Ser. No. 351,353

Claims priority, application Japan, Feb. 25, 1981, 56-25595[U]; Oct. 13, 1981, 56-152525[U]

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **4 Claims**



1. In an endoscope including

a manipulator unit having an inlet opening formed therein;

a flexible tube connected with and following said manipulator unit;

a front end metal fitting mounted on a front end of said flexible tube;

a channel provided in said flexible tube communicating with said opening formed in said manipulator unit and through which a desired implement, inserted into said inlet opening, can be guided through said flexible tube to said front end metal fitting;

a first optical fibre bundle for illumination extending through said manipulator unit and said flexible tube to an illuminating window formed in said front end metal fitting;

a second optical fibre bundle for observation extending from a viewer unit provided on said manipulator unit through said flexible tube to a viewing window formed in said front end metal fitting;

an opening formed in the front end metal fitting laterally of said viewing window and communicating with said channel;

a raiser member located in side-by-side relationship with said viewing window and pivotally supported within said opening; and

a raiser manipulating wire extending from a free end of said raiser member through said front end metal fitting and said flexible tube to said manipulator unit so that said raiser member may be rotated by pulling the wire from the exterior of said manipulator unit;

wherein the front end of said implement introduced through said inlet opening formed in said manipulator unit into the flexible tube is guided by a guiding effect and a pivotal movement of said raiser into a visual field of the viewing window,

the improvement comprising:

raising means characterized by that said raiser member is pivotally supported by a transverse axis extending substantially orthogonally with respect to a vertical plane including the optical central axis of said viewing window and said raiser member further includes a slanted guide groove in the surface thereof in opposed relationship to the open end of said channel, said slanted guide groove being inclined towards said viewing window, wherein said raiser manipulating wire is pulled from the exterior of said manipulator unit and thereby said raiser member is rotated around said transverse axis in a plane substantially parallel to the vertical plane including the optical central axis of said viewing window so that the front end of the implement which creeps up along said slanted guide groove and has been projected outwardly from said front end metal fitting may be guided into the visual field of the view window.

4,407,274

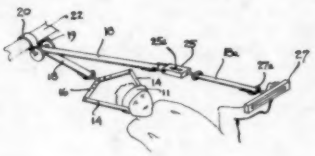
CERVICAL TRACTION DEVICE

Paul H. Goodley, 2210 W. 3rd St., Los Angeles, Calif. 90057

Continuation-in-part of Ser. No. 135,895, Mar. 31, 1980, abandoned. This application Jun. 5, 1981, Ser. No. 270,781

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—69 **13 Claims**



1. In a cervical traction device for use in applying traction to the cervical spine of a user comprising

harness means a portion thereof which fits against the occiput of the user's head,

traction strap means removably attached to said portion of said harness means at a preselected position therealong,

said traction strap being positionable along said portion of said harness means at any selected position thereon,

attachment means fixedly attached to said strap means at each of the opposite ends thereof,

a traction bar positioned above the user's head, the attachment means being removably connected to said traction bar near the opposite ends thereof,

line means attached to said traction bar at a predetermined position therealong,

means for doubling said line means back on itself so that it returns to a position below the user's head,

a force indicator device positioned within view of the user attached at one end to said line means,

second line means attached at one end thereof to the other end of said force indicator device,

force input drive means attached to the other end of said second line means for receiving a force input from the user,

whereby the force applied by the user to said force input drive means is applied to the user's neck in a predetermined symmetrical or asymmetrical manner which is in accordance with the attachment position of said traction strap means, said force being indicated on said indicator device.

4,407,275

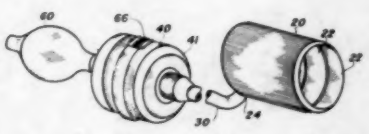
ARTIFICIAL ERECTION DEVICE

William S. Schroeder, P.O. Box 607, Coos Bay, Oreg. 97420

Filed Nov. 19, 1981, Ser. No. 322,966

Int. Cl.³ A61F *5/42*

U.S. Cl. 128—79 **7 Claims**



1. A prosthetic device for increasing the blood pressure and volume in a penis creating or maintaining an erect condition comprising:

a. a semi-rigid annular ring having a plurality of flexible individually expandable chambers therein, the inside diameter somewhat smaller than said erect penis with the length substantially shorter, the inside surface planar with said ring when said chambers are relaxed;

b. a multi-port flexible conduit connected to said individual expandable chambers allowing a separated flow path for each chamber while grouping together in one conduit;

c. a ratcheted sequential valve attached to said annular ring with said multi-port flexible conduit for diverting intermittant pneumatic pressure in sequence from a pulsating source to said ring allowing only one chamber to be pressurized at a given time, also a manual valve mechanism to depressurize said chamber when unwanted; and,

d. a flexible bulb creating pneumatic pressure means attached to said valve for providing compressed air to the apparatus in pulsating fashion having an inlet check valve and a first and second outlet check valve, being of a size to fit into ones hand and actuated by squeezing, therefore, increasing the air pressure contained within said inlet check valve providing a one-way inlet path for continuing the source of the pneumatic pressure, said first outlet check valve being disposed with said ratcheted sequential valve for the bellows actuator to supply one-way air thereto, and said second outlet check valve also connected to said ratcheted sequential valve for sequenced one-way direction to said expandable chambers for sequencing said valve and inflating said chamber.

4,407,276

BRACE FOR ARTICULATED LIMBS

Gary R. Bledsoe, Arlington, Tex., assignor to Medical Designs, Inc., Arlington, Tex.

Filed Jan. 22, 1981, Ser. No. 227,381

Int. Cl.³ A61F *3/00, 5/00*

U.S. Cl. 128—80 C **8 Claims**

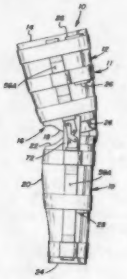
1. An external bracing apparatus for controlling the degree of motion which is permitted to a person's knee, comprising:

(a) first and second flexible sheets of cushioned material, one of which is adapted for snugly wrapping around the wearer's thigh and the other being adapted for snugly wrapping around the wearer's calf, and the width of each sheet being sufficient to circumferentially envelope at least most of its associated leg member, and the length of each sheet

being sufficient to encompass more than half of the length of the respective leg member, and said flexible sheets being selectively removable and replaceable around the wearer's leg members;

(b) first and second pairs of elongated braces which are adapted to be connected by hinge means, each of the braces being relatively stiff so as to resist both torsion and bending loads, and the first pair of elongated braces being adapted to lie on opposite sides of the wearer's thigh and the second pair of elongated braces being adapted to lie on opposite sides of the wearer's calf;

(c) attachment means carried by said first and second pairs of braces for adjustably positioning and selectively attaching the first and second pairs of elongated braces to attachment means the exterior sides of respective ones of the first and second flexible sheets after said sheets have been wrapped around their associated leg members;



(d) hinge means attached to respective ends of the braces which are adapted to lie on each side of the wearer's leg, and said hinge means being effective for controlling the angle that is formed by the two braces on a given side of the wearer's leg; and

(e) a plurality of non-elastic straps which are selectively attachable to the outside surface of said braces and which are adapted to be wrapped circumferentially around the wearer's leg members, and said straps having connecting means so that they may be placed in tension around the wearer's leg and secured to the elongated braces.

4,407,277

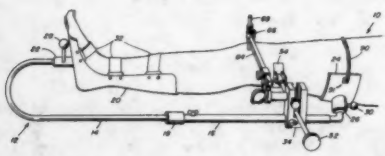
SURGICAL APPARATUS

Arthur E. Ellison, Adams Rd., Williamstown, Mass. 02167

Filed Oct. 27, 1980, Ser. No. 200,789

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—82 **13 Claims**



1. Apparatus for applying and maintaining forces and moments on a knee joint along any one or combination of its degrees of freedom to open said joint during arthroscopic surgical procedures on said knee joint comprising:

an upper leg restraining member adapted for immobilizing longitudinally and rotationally said upper leg;

a lower leg restraining member adapted for immobilizing longitudinally and rotationally said lower leg; and

structural means interconnecting said upper leg restraining member and said lower leg restraining member;

an arthroscope; and

means for attaching said arthroscope to said interconnecting structural means to support said arthroscope in adjustable relation to said knee joint;

said interconnecting structural means adapted for establishing and preserving a relative orientation between said upper leg restraining member and said lower leg restraining member and thereby generating said forces and moments on said knee joint along any one or combination of its said degrees of freedom to open up said knee joint for arthroscopic visualization.

4,407,278

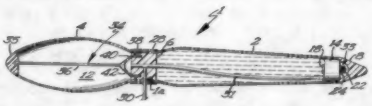
PENILE PROSTHESIS WITH IMPROVED FLUID CONTROL

John H. Burton; Bradford G. Staehle, both of Minnetonka, and Charles C. Kuyava, Brooklyn Center, all of Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 264,202, May 15, 1981, Pat. No. 4,383,525. This application May 3, 1982, Ser. No. 373,481

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—79 **21 Claims**



1. An implantable penile prosthesis comprising:

at least one elongated cylinder adapted to be implanted within a patient's penis, said cylinder having a flexible distal end section for implantation within the pendulous penis which is constructed to rigidize upon being filled with pressurizing fluid, and a proximal, rear end section adapted to be implanted within the root end of the penis;

a fluid reservoir chamber formed within said proximal, rear end section of said cylinder;

pump means manually operable to transfer fluid under pressure from said fluid reservoir chamber to said flexible distal end of said cylinder for achieving an erection; and

externally operable valve means contained within said cylinder for controlling the flow of fluid back and forth between said fluid reservoir chamber and said flexible distal end of said cylinder, said valve means being located within said flexible, distal end section of said cylinder at a position where it will be readily accessible within the pendulous penis for actuation at a distally remote location from the root end thereof, and said valve means incorporating check valve means normally precluding the flow of pressurized fluid from within said flexible distal end section of said cylinder through said valve means back to said fluid reservoir chamber; and

fluid conduit means within said elongated cylinder in fluid flow communication between said fluid reservoir chamber and said valve means.

4,407,279

APPARATUS FOR INHALATION

Wladimir Tschernezky, 15 Belgrave Lodge, 36 Wellesley Rd., London, W.4, England

Filed Aug. 27, 1981, Ser. No. 296,954

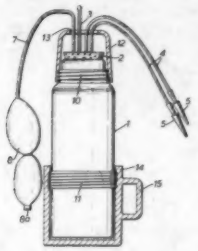
Claims priority, application United Kingdom, Aug. 29, 1980, 8027934

Int. Cl.³ A61M *15/00*

U.S. Cl. 128—200.11 **9 Claims**

1. Apparatus for inhalation comprising a single vacuum flask for holding a liquid and from which liquid vapour is to be inhaled, closure means for closing one end of the flask after the

liquid has been introduced, air supply means, a connecting tube which passes through the closure means and via which air for inhalation is arranged to be fed from the air supply means to a region inside the flask adjacent the end remote from the closure means so as to bubble up through the liquid when contained therein, inhalation tube means which passes through the closure means for collecting the air after it has bubbled up



through the liquid and which is adapted at one end thereof remote from the flask to fit to the nostrils whereby direct inhalation of air and vapour into the nostrils is facilitated, a thermometer which passes through the closure means and which is for measuring the temperature of the liquid in the flask, and a measuring cup which is for measuring the amount of liquid to be provided in the flask and which screws over the bottom of the flask.

4,407,280

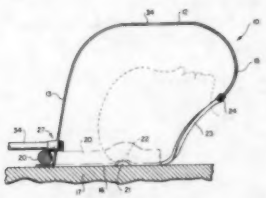
DISPOSABLE HOOD

W. Edgar Trammell, 840 N. 1200 East, Provo, Utah 84601; James E. Young, 2080 E. 4675 South, Salt Lake City, Utah 84117; James R. Chidester, 5780 W. 9600 North, and Ralph S. Walker, 9767 N. 6530 West, both of Highland, Utah 84003

Filed Jun. 16, 1981, Ser. No. 274,182

Int. Cl.³ A61M *16/02*

U.S. Cl. 128—205.26 **8 Claims**



1. A disposable hood of unitary one-piece construction for maintaining a desired gas atmosphere about the head of a patient, said hood comprising

a generally bubble-shaped chamber comprising side, forward and back sidewalls and a top, said sidewalls and top being molded from transparent, optically clear material, with the sidewalls being joined to themselves and to the top in arcuate contours so that the hood has no sharp corners;

a substantially open bottom side for the generally bubble-shaped hood, said bottom side being adapted to rest on the bed on which the patient is laying;

flat extension means extending from the lateral and back edges of the open bottom side of said hood so that the flat extension means are adapted to lie flatwise on the bed;

an opening in the forward sidewall of said hood which is adapted to fit over the neck of a patient whose head is positioned in said hood, with the forward sidewall being formed so as to curve in the general shape of a question mark curving continuously downwardly then inwardly and then downwardly, with the opening for the patient's neck being formed in the lower portion of the inwardly and downwardly curving portions of said forward sidewall;

an aperture in the back sidewall of said hood; and

an attachment means for connecting a flexible conduit or hose to said aperture.

4,407,281

INTRATRACHEAL TUBE

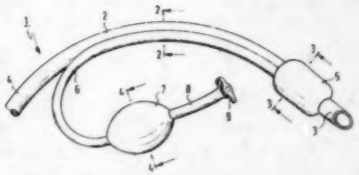
Ludwig Brandt, Heymannstrasse 5, 2000 Hamburg 20, and Hellmut Pokar, Strandweg 9, 200 Hamburg 55, both of Fed. Rep. of Germany

Filed Jul. 23, 1981, Ser. No. 286,251

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1980, 3028568

Int. Cl.³ A61M *15/08, 25/00*

U.S. Cl. 128—207.15 **5 Claims**



1. An intratracheal tube for giving respiration to a patient, specially during a narcosis with a mixture of oxygen and narcotic gas, wherein the intratracheal tube comprises a respirator hose adapted to be pushed in the windpipe of the patient, the forward end of said hose being surrounded by a blocking sleeve permeable to narcotic gas and inflatable from the outside with a filling gas and in inflated state abutting closely on the windpipe wall, wherein the inner space of said blocking sleeve is connected in gas-conveying manner, via a connecting hose, to an inflation port and to a diffusion vessel situated outside the patient, the surface size, wall thickness and material of said diffusion vessel being chosen so as to make it impervious to the filling gas, but pervious to narcotic gas, thereby permitting the outward diffusion of narcotic gas, specially nitrous oxide gas, in an amount corresponding approximately to the amount diffused into said blocking sleeve.

4,407,282

METHOD AND APPARATUS FOR GENERATING SUPEROXIDE AND HYDROXYL IONS IN SOLUTION

Mitchell R. Swartz, 2 Ridgewood Rd., Malden, Mass. 02148

Division of Ser. No. 49,702, Jun. 18, 1979, Pat. No. 4,305,390, which is a continuation-in-part of Ser. No. 879,822, Feb. 21, 1978, Pat. No. 4,181,128, which is a continuation-in-part of Ser. No. 636,290, Nov. 28, 1975, Pat. No. 4,139,348. This application Oct. 24, 1980, Ser. No. 200,554

Int. Cl.³ A61J *3/00*

U.S. Cl. 128—207.21 **27 Claims**

1. A method of generating oxygen in an excited electronic state comprising:

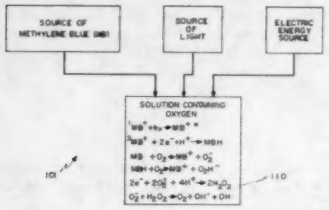
(a) providing a solution containing oxygen;

(b) adding to said solution an electroactive mediator which assumes an excited electronic state when subjected to light and an electronic field concurrently;

(c) directing light into the solution; and

(d) simultaneously applying an electric field to the solution, said light and said electric field serving, in combination,

for conversion of said electroactive mediator to at least one excited electronic state, the thusly activated electroactive mediator reacting with the oxygen in the solution to produce oxygen in an excited electronic state.

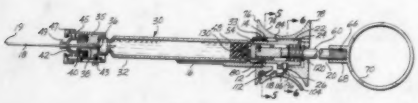


4,407,283

SELF-INJECTING SYRINGE

Francis D. Reynolds, Redmond, Wash., assignor to Dale C. Grier, Bellevue, Wash.

Filed Oct. 19, 1981, Ser. No. 312,535
Int. Cl.[3] A61M *5/00*
U.S. Cl. 604—136 8 Claims



1. A self-injecting syringe, comprising:

a finger-grip body having first and second ends and an annular sidewall defining an inner chamber, and including an outer surface grip portion adapted to be gripped by fingers of a user;

a first bushing having a first end portion which is slidably received within said chamber, and a second end portion extendable axially from said first end portion out through the first end of said body;

stop means for preventing movement of said bushing out from said body;

an end wall at the second end of said body;

a syringe barrel having a first end connected to the first end of said body, a second opposite end, and a cartridge chamber;

a second bushing within the second end of the syringe barrel adapted for axial movement, said second bushing including a central needle receiving opening;

an end cap at the second end of the barrel;

a first compression spring between the end cap and the second bushing, normally biasing said second bushing rearwardly;

a second compression spring within said inner chamber, bearing at one of its ends against said first bushing and at its opposite end against said end wall, said compression spring normally biasing said first bushing toward said stop means; and

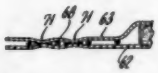
releasable lock means within said body, including a lock member operable to lock said first bushing into a retracted position, said second compression spring being compressed, and said first bushing being spaced axially from said stop means when said first bushing is in its retracted position, and a release trigger means positioned to be contacted by a finger positioned on the grip portion of said body, whereby finger pressure on said trigger means will unlock said lock means, releasing the second compression spring and allowing it to drive the bushing axially within said body until the bushing contacts the stop means.

4,407,284

LAMINATED STRUCTURES HAVING GATHERED AND UNGATHERED MARGINAL PORTIONS AND METHOD OF MANUFACTURING THE SAME

Heinz A. Pieniak, Chicago, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Division of Ser. No. 120,194, Feb. 11, 1980, Pat. No. 4,333,782.
This application Jul. 6, 1981, Ser. No. 280,675
Int. Cl.[3] A41B *13/02;* A41D *27/10;* B32B *3/10*
U.S. Cl. 604—385 23 Claims



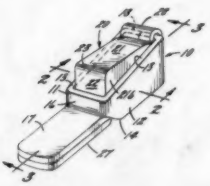
1. A laminated structure having a marginal area with a first portion of said marginal area being gathered and a second portion of said marginal area not being gathered to provide improved fit about a portion of the human body comprising: first and second layers positioned adjacent to one another, said layers being formed of flexible gatherable material, an elastic member disposed between said layers in the marginal area thereof, said elastic member comprising a plurality of longitudinally extending elastic elements, said elements being transversely connected over a portion of their length to define apertures therebetween, said first and second layers being secured together through at least some of said apertures to provide a gathered marginal portion, and an end portion of said elastic member without apertures comprising longitudinally extending elements not transversely connected to provide an ungathered marginal portion.

4,407,285

MICROSURGICAL CLIP FOR BRAIN SURGERY OR THE LIKE

Alfred R. Perlin, Highland Park, Ill., assignor to Metatech Corporation, Northbrook, Ill.

Filed Apr. 13, 1981, Ser. No. 253,191
Int. Cl.[3] A61B *17/12*
U.S. Cl. 128—325 6 Claims



1. A microsurgical clip for clamping of small blood vessels comprising, in combination, a hollow shell or generally rectangular shape having (a) opposed side walls, (b) a bottom wall and (c) a front wall, the back and top of the shell being open, the shell having (d) a duck bill projecting forwardly at lower edge of the front wall and integral therewith, a cooperating insert of zigzag shape nested in the shell and made up of (1) a top wall, (2) a front wall generally perpendicular thereto and (3) an integral duck bill projecting forwardly at the lower edge of its front wall, the bottom wall being foreshortened to provide a downwardly facing aperture immediately behind the front wall of the shell, the front wall of the insert being vertically dimensioned to extend downwardly through the aperture in the bottom wall so that the duck bill on the insert flatly and conformingly underlies the duck bill on the shell, the insert having its top wall captively hinged between the side walls in

a position adjacent the back of the shell, and an expensible spring seated between the bottom wall of the shell and the top wall of the insert for urging the insert relatively upwardly in the shell thereby biasing the duck bills into resilient clamping engagement with one another, the upper edges of the side walls being angled downwardly from the back toward the front wall, the side walls and the front wall of the shell being relieved by making them of reduced height so that the insert is exposed with the forward portion thereof projecting upwardly from the shell with the result that fingertip application of pinching pressure to the projecting insert causes it to move downwardly with respect to the shell compressing the spring and accompanied by relative spreading of the duck bills for engagement of a blood vessel therebetween, the spacing between the side wall being only a small fraction of the width of a fingertip, and the depth of the relief, and hence the range of spreading movement, being limited to insure that the spring is operated well within its elastic limit.

4,407,286

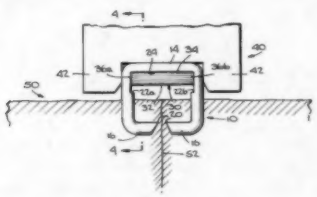
SURGICAL STAPLES

Douglas G. Noiles, New Canaan, and John O. Crawford, Brookfield Center, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 181,092, Aug. 25, 1980, abandoned. This application May 13, 1982, Ser. No. 377,860

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 R **8 Claims**



1. The method of applying surgical staples to body tissue comprising the steps of:

positioning an anvil member adjacent to the surface of the tissue to be stapled;

providing a surgical staple having a longitudinal base, two legs at respective opposite ends of the base, and two surfaces on the base transverse to the longitudinal axis of the base, the transverse surfaces facing one another and being spaced longitudinally along the base from one another and from the legs;

positioning the staple so that the base is substantially parallel to the surface of the tissue to be stapled and so that a central portion of the base intermediate the transverse surfaces is in contact with an anvil member surface which faces away from the surface of the tissue;

advancing a staple former substantially perpendicular to the surface of the tissue to bend the staple base around the anvil member so that the legs of the staple penetrate the tissue and so that the transverse surfaces overlap portions of the anvil member surface which face the surface of the tissue to substantially prevent retraction of the staple by the staple former when the staple former is subsequently retracted in a direction opposite the staple former advancing direction; and

retracting the staple former in the direction opposite the staple former advancing direction to leave the formed staple around the anvil member and in the tissue.

4,407,287

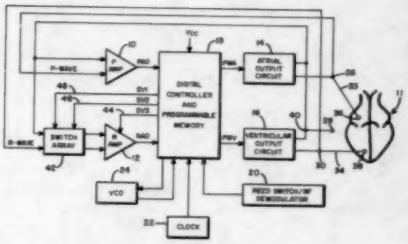
ATRIAL AND VENTRICULAR-ONLY PACEMAKER RESPONSIVE TO PREMATURE VENTRICULAR CONTRACTIONS

Lodewijk-Jozef Herpers, Kerkrade-West, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 17, 1981, Ser. No. 235,227

Int. Cl.³ A61N *1/38*

U.S. Cl. 28—419 PG **12 Claims**



1. A pulse generator comprising:

atrial and ventricular terminal means for connection respectively to the atrium and ventricle of a patient's heart;

ventricular pulse providing means connected to said ventricular terminals means for selectively delivering stimulating pulses to said ventricular terminals means at a ventricular timing rate;

atrial and ventricular sensing means connected to said atrial and ventricular terminal means and operative for sensing atrial and ventricular contractions of the patient's heart;

atrial-ventricular (A-V) timing means operatively connected to said atrial sensing means and said ventricular pulse providing means and operative in response to a sensed atrial contraction to cause said ventricular pulse providing means to deliver a stimulating pulse at the end of a first A-V delay interval from said sensed atrial contraction;

counting means for counting ventricular contractions and providing an A-V disable interval signal commencing when a ventricular contraction is sensed following a prior ventricular contraction and in the absence of an intervening atrial contraction; and

means responsive to the A-V disable interval signal for preventing said A-V timing means from responding to a sensed atrial contraction for the duration of the A-V disable interval.

4,407,288

IMPLANTABLE HEART STIMULATOR AND STIMULATION METHOD

Alois A. Langer, Pittsburgh; Steve A. Kolenik, Leechburg; Marlin S. Heilman, Gibsonia, all of Pa.; Mieczyslaw Mirowski, 2405 Velvet Valley Way, Owings Mills, Md. 21117, and Morton M. Mower, Lutherville, Md., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Continuation-in-part of Ser. No. 215,275, Dec. 11, 1980. This application Mar. 16, 1981, Ser. No. 243,801

Int. Cl.³ A61D *1/36*

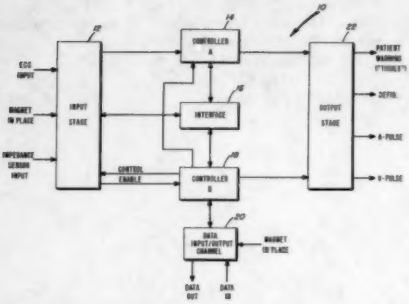
U.S. Cl. 128—419 PG **37 Claims**

1. A method of heart stimulation using an implantable heart stimulator capable of detecting a plurality of arrhythmias and capable of being programmed to undergo a single or multimode operation to treat a detected arrhythmia, corresponding to said mode of operation the method comprising the steps of:

(a) determining a condition of the heart from among a plurality of conditions of the heart;

(b) selecting at least one mode of operation of the implantable heart stimulator which operation includes a unique

sequence of events corresponding to said determined condition; and



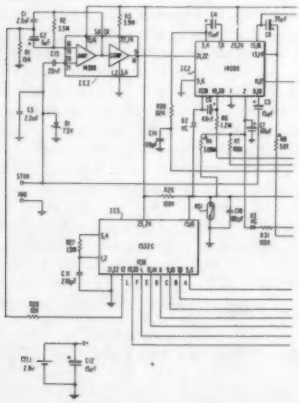
(c) executing said at least one mode of operation of said implantable heart stimulator thereby to treat said determined heart condition.

4,407,289

EXTERNALLY-RESET TACHYCARDIA CONTROL PACER

Tibor A. Nappholz, Drummoyne, and Stephen J. Swift, Hornsby, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Mar. 19, 1981, Ser. No. 245,356
Int. Cl.³ A61N *1/38*
U.S. Cl. 128—419 PG **14 Claims**



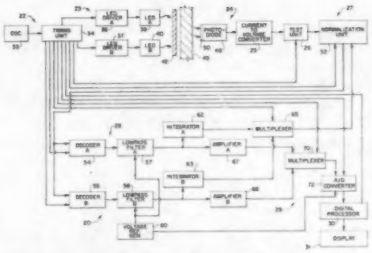
1. A tachycardia control pacer comprising battery means for powering the pacer; means for confirming tachycardia; means responsive to said confirming means for generating at least one heart-stimulating pulse at the end of a time delay following the last heartbeat within a time range which potentially allows tachycardia to be terminated; externally-controlled means for operating independently of said tachycardia confirming means and for controlling the generation of at least two pulses separated by a time interval which is dependent upon the potential of said battery means; said externally-controlled means including a switch operable by a magnet held in the vicinity of the pacer; means for inhibiting operation of said pulse generating means, after said at least two pulses are generated, for as long as said magnet continues to be held in the vicinity of the pacer; program control means for changing the pacer operation in accordance with externally-generated signals which represent programmed parameters, one such change being the selective disablement or enablement of the generation of heart stimulating pulses; said inhibiting means allowing the generation of pulses to be disabled temporarily until a programmed disablement can be effected; means for scanning said time delay during successive cycles of operation of said pulse generating means; said externally-controlled means governing the operation of said program control means to change the range through which said time delay is scanned in accordance with programmed parameters; and means responsive to operation of said externally-controlled means for causing the next time delay to be dependent upon only a time delay controlled by said scanning means.

4,407,290

BLOOD CONSTITUENT MEASURING DEVICE AND METHOD

Scott A. Wilber, Boulder, Colo., assignor to Biox Technology, Inc., Boulder, Colo.

Filed Apr. 1, 1981, Ser. No. 250,956
Int. Cl.³ G01N *33/16*
U.S. Cl. 128—633 **36 Claims**



1. A blood constituent measuring device, comprising:

electromagnetic energy emitting means for emitting electromagnetic energy at a plurality of predetermined wavelengths through a blood-containing sample at a test area;

sensing means for receiving electromagnetic energy from said sample at said plurality of wavelengths;

signal producing means connected with said sensing means to produce output signals responsive to electromagnetic energy received by said sensing means at said plurality of wavelengths;

normalizing means for receiving said output signals from said signal producing means and scaling the same so that the DC components are normalized; and

processing means for receiving said output signals from said normalizing means and producing an output indicative of changes in the thickness of preselected constituents of blood relative to the total change in blood thickness.

4,407,291

TRANSCUTANEOUS BLOOD OXYGEN MEASURING DEVICE

Bunji Hagihara, 8-17, Fujishirodai 2-chome, Suita, 565; Tamotsu Fukai, Osaka; Kikuo Nomura, Osaka; Kenichi Yoshida, Osaka, and Isao Isshiki, Osaka, all of Japan, assignors to Sumitomo Electric Industries Ltd., Osaka and Bunji Hagihara, Suita, both of, Japan, part interest to each

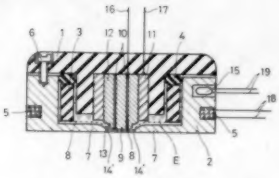
Continuation-in-part of Ser. No. 34,132, Apr. 27, 1979, abandoned. This application Aug. 7, 1980, Ser. No. 176,033
Claims priority, application Japan, May 12, 1978, 53-63373[U]
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **9 Claims**

1. An electrode assembly for the transcutaneous measure-

ment of partial oxygen pressure in arterial blood including in combination;

an electrode portion having a cathode electrode surrounded by an anode electrode and an insulating means between and supporting said anode electrode and said cathode electrode, each of said cathode electrode and said anode electrode having end portions, said insulating means having a first cylindrical end portion and a second cylindrical end portion extending from said first cylindrical end portion to a second and extended position, said second cylindrical end portion being coaxial with said first cylindrical end portion and having a diameter less than said first cylindrical end portion so as to form a step therebetween, said cathode end portion extending at least to said second position;

heating means, connected to said electrode portion, having a face adapted to contact skin for heating skin in contact therewith, said face having an opening for presenting said second cylindrical end portion of said insulating means and with said end portion of said cathode electrode therein; and



an oxygen permeable membrane disposed between said face of said heating means and the end portions of said electrodes, the membrane covering said end portions of each of said electrodes and defining a space adapted to retain a liquid electrolyte between the end portions of each of said electrodes and said membrane;

wherein said end portion of said cathode electrode is disposed and extends beyond the plane of the end portion of said anode electrode towards said opening, said end portion of said cathode electrode is positioned concentrically with the axis of said opening such that a surface of said membrane away from said electrode portion, in cooperation with the end portion of said cathode electrode, is slightly offset from the plane of said heating face, and further wherein the opening in said heating means has rounded shoulders adjacent the extending portion of said cathode electrode, the rounded shoulders and cathode end portion positioned in proximity to each other and providing a predetermined tension on the membrane therebetween, said cathode end portion contained in said second cylindrical end portion extending into said opening to effect said offsetting and said tensioning.

4,407,292

PROCEDURE AND APPARATUS FOR NONCONTACTING MEASUREMENT OF SUBCUTANEOUS TEMPERATURE DISTRIBUTIONS

Jochen Edrich, Waldpromenade 83, Gauting, Fed. Rep. of Germany 8035 J.E.

Division of Ser. No. 66,076, Aug. 13, 1979, Pat. No. 4,275,741. This application Jan. 21, 1981, Ser. No. 226,630

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1978, 2835602

Int. Cl.³ A61B *6/00*

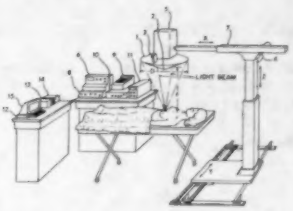
U.S. Cl. 128—653 **4 Claims**

1. An improved apparatus for noncontacting measurement of subcutaneous body temperature distributions in a body, said improved apparatus comprising:

an elliptical reflector for receiving emitted electromagnetic thermal radiation from a subcutaneous point in said body and for focusing said received thermal radiation, said reflector having an aperture diameter of between 50 to 100 cm and an object focal length of between 0.6 and 1.6 times said aperture diameter,

a receiving horn imbedded into the image focal point of said reflector for receiving said focused thermal radiation,

means operatively connected to said receiving horn for generating an output indicative of the subcutaneous body



temperature at said point, said reflector, horn, and generating means being capable of operating in the microwave thermal radiation range of 8 to 36 GHz, and

means for supporting said elliptical reflector with said imbedded receiving horn above said body at a distance equal to the object focal length of said reflector less the depth of the subcutaneous tissue.

4,407,293

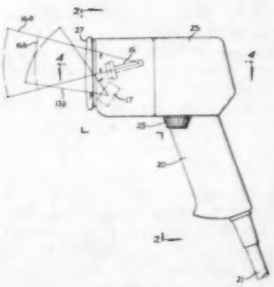
ULTRASOUND IMAGING APPARATUS FOR PROVIDING SIMULTANEOUS B-SCAN AND DOPPLER DATA

Joe R. Suarez, Jr., Fremont; Henry L. Schwartz, Los Gatos; Anthony J. Rossetti, San Jose, and Paul D. Corl, Stanford, all of Calif., assignors to Diasonics, Inc., Milpitas, Calif.

Filed Apr. 24, 1981, Ser. No. 257,506

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—660 **21 Claims**



1. An ultrasound imaging apparatus comprising:

a hand-holdable housing;

a fluid chamber formed within said housing, one portion of said chamber being defined by a flexible membrane;

a first transducer mounted for oscillatory movement in a first plane within said fluid chamber to provide a B-scan display, said first transducer mounted such that its field of view passes through said membrane;

a second transducer for providing Doppler data mounted within said fluid chamber such that its beam moves within said first plane;

positioning means coupled to said second transducer for positioning said beam of said second transducer in said first plane; and

circuit means for interlacing ultrasound pulses from said first and second transducers to provide an updated B-scan display and Doppler data, said circuit means including means for interrupting transmissions by one of said transducers to enable transmission and reception by said other transducer;

whereby continuous B-scan and Doppler data are provided.

4,407,294

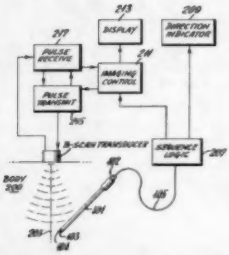
ULTRASOUND TISSUE PROBE LOCALIZATION SYSTEM

David H. R. Vilkomerson, Princeton, N.J., assignor to Technicare Corporation, Solon, Ohio

Filed Jan. 7, 1982, Ser. No. 337,908

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **10 Claims**



1. Apparatus for performing medical procedures upon select, internal body tissues, comprising:

(a) a pulse-echo ultrasound imaging system for imaging a scan area of the body including said tissues, said imaging means including first imaging transducer for acoustic coupling to the exterior of the body;

(b) probe means for insertion into the body in the vicinity of said area in a direction which is independent of the angle and position of said first transducer means;

(c) a plurality of second detector-transducers disposed at selected locations on said probe means for receiving pulses from said first transducer;

(d) circuit means electrically coupled to said detector-transducers for sensing the sequence of arrival of ultrasonic waves at said locations;

whereby the relative directional position of said probe means with respect to said scan area may be determined.

4,407,295

MINIATURE PHYSIOLOGICAL MONITOR WITH INTERCHANGEABLE SENSORS

Robert R. Steuer; Robert K. Rogers, both of Salt Lake City, and Robert H. Horne, Holladay, all of Utah, assignors to DNA Medical, Inc., Salt Lake City, Utah

Filed Oct. 16, 1980, Ser. No. 197,704

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—670 **8 Claims**

1. A physiological parameter measuring system for non-invasive measurement of parameters of the body of a user, said system comprising:

a main housing adapted to be carried on the body of the user;

first connecting means mounted on said housing;

a visual display means mounted in said housing;

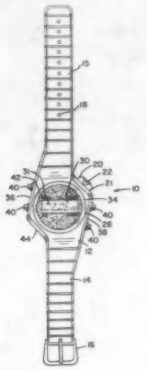
signal processing and display circuitry electrically connected to said connecting means and said display means, said signal processing and display circuitry for converting a standarized information signal into an eye-readable format on said visual display means, said standardized information signal representing a physiological parameter value to be converted into an eye-readable format by said signal processing and display circuitry without further transformation;

at least two remote sensors, said sensors being associated with at least two different physiological parameters and adapted to be associated with a different part of the body;

each sensor comprising:

a sensor housing;

sensing means mounted on the housing for detecting at least one desired physiological parameter;



second connecting means;

dedicated circuitry within said sensor housing for transforming said detected physiological parameter into said standardized information signal;

means for conveying said standarized information signal to said second connecting means, said second connecting means adapted to conductively mate with said first connecting means in order to transfer said information signal to said signal processing and display circuitry.

4,407,296

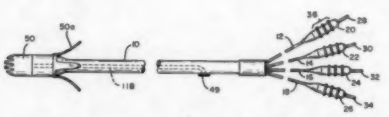
INTEGRAL HERMETIC IMPANTABLE PRESSURE TRANSDUCER

Kenneth M. Anderson, Bloomington, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 12, 1980, Ser. No. 186,373

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—675 **7 Claims**



1. An implantable pressure transducer comprising:

a sealed container having a flexible wall fully filled with a first liquid;

lead-in conductors exposed to the exterior of said container;

a basic pressure transducer having a sensing surface and a vent and coupled to said lead-in conductors, wherein pressure impinging on said sensing surface relative to pressure impinging on said vent may be electrically detected from said lead-in conductors, said transducer fixedly mounted to said container with said first liquid impinging on said sensing surface and with said vent exposed to the exterior of said container;

conductor means for coupling said transducer to associated electronic circuitry, coupled to said lead-in conductors;

connectors electrically coupled to said conductor means;

a vent tube having a first end and a second end, fully filled with a second liquid, said first end sealably coupled to said vent, said second liquid impinging on said vent;

a membrane sealably coupled to the second end of said vent tube whereby the pressure differential between pressure external to said container and to said membrane may be electrically detected from said connectors; and

a lead body of a material substantially inert to body fluid encasing said conductor means and said vent tube, said lead body having an aperture wherein said membrane is exposed to the exterior of said lead body, said lead body fixedly mounted to said container and to said connectors.

4,407,297

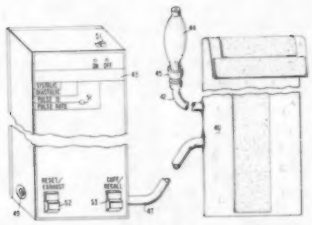
METHOD AND APPARATUS FOR PERFORMING NON-INVASIVE BLOOD PRESSURE AND PULSE RATE MEASUREMENTS

Michael E. Croslin, Forest Hills Gardens, N.Y., assignor to Medtek Corporation, Carrollton, Tex.

Division of Ser. No. 64,194, Aug. 6, 1979, Pat. No. 4,271,844, which is a continuation-in-part of Ser. No. 499, Jan. 2, 1979, and a continuation-in-part of Ser. No. 774,970, Mar. 7, 1977. This application Nov. 20, 1980, Ser. No. 208,825

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—681 **19 Claims**



1. An instrument for taking blood pressure measurements comprising means for occluding the artery of a patient with a pressurized occluding cuff and for then allowing the pressure to bleed down; pressure transducer means coupled to said cuff for generating a sample of the instantaneous cuff pressure; means for controlling the generation of samples at a rate high enough to insure that at least several samples are generated during each blood pressure pulse of normal duration; and means for (a) registering the value of the sample which is generated at the start of a blood pressure pulse, and maintaining such starting value for the duration of at least several of the succeeding blood pressure pulses, (b) deriving the height of a blood pressure pulse by subtracting the respective starting value registered by said registering means from the largest sample value for the respective blood pressure pulse, and maintaining said height for the duration of at least several of the succeeding blood pressure pulses, and (c) utilizing at least several maintained starting values and heights for determining blood pressure measurements; said number of maintained starting values and heights being substantially less than the number of blood pressure pulses which occur during the course of a blood pressure measurement.

4,407,298

CONNECTOR FOR THERMODILUTION CATHETER

David J. Lentz, Mission Viejo, and Richard B. Houghton, Irvine, both of Calif., assignors to Critikon Inc., Tampa, Fla.

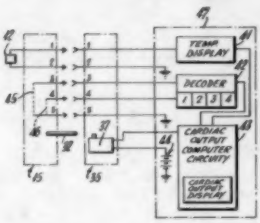
Filed Jul. 16, 1981, Ser. No. 283,716

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—713 **6 Claims**

1. In a thermodilution catheter having respective distal and proximate ends, temperature sensing means at said distal end and connector means at said proximate end for attaching said thermodilution catheter to a cardiac output computer,

the improvement wherein said connector means comprises a plurality of electrically conductive pins, the first and second of said pins being connected to said temperature sensing means, and the third, fourth, and fifth of said pins



being adapted to receive conductive bridging members between said third and fifth pair of pins and between said fourth and fifth pair of pins, said connector further selectively comprising, in correspondence to catheter size, connective bridging members to couple selectively said pins and thereby to indicate catheter size according to the following arrangement:

Catheter size	Pins 3–5	Pins 4–5
1	open	open
2	open	closed
3	closed	open
4	closed	closed.

4,407,299

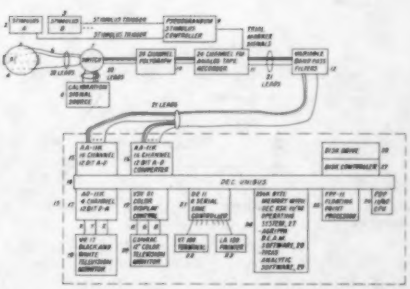
BRAIN ELECTRICAL ACTIVITY MAPPING

Norman D. Culver, Spotswood, N.J., assignor to The Children's Medical Center Corporation, Boston, Mass.

Filed May 15, 1981, Ser. No. 264,031

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—731 **4 Claims**



1. Apparatus for generating a topographic display of information on the electrical activity of the brain, said apparatus comprising

a plurality of electrical-activity transducers adapted to be placed at spaced apart locations on the skull of a patient,

processing means connected to be responsive to said transducers to generate a time sequence of response matrices, the elements of each said response matrix representing the instantaneous amplitudes of responses of said transducers at various locations on the skull,

said processing means including means to generate from said time sequence of response matrices a succession of running-average matrices each corresponding to an average of a plurality of successive response matrices in said sequence, at least two of said running-average matrices corresponding respectively to two averages which include in common at least one of said response matrices,

display means connected to be responsive to said processing means, for displaying said running-average matrices as a time sequence of topographic maps of the skull, the elements of said running-average matrices defining discrete points of said maps.

4,407,300

POTENTIOMETRIC DIAGNOSIS OF CANCER IN VIVO

Robert E. Davis, 125 Hillcrest Dr., Hinsdale, Ill. 60521

Filed Jul. 14, 1980, Ser. No. 168,018
Int. Cl.³ A61B 5/05
U.S. Cl. 128—734 3 Claims

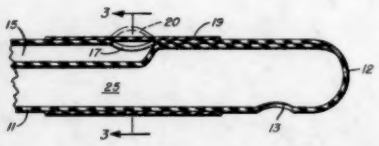
1. A method for scanning and diagnosing the absence or presence and location of malignant cancerous tissue in an area of the body comprising: measuring the presence or absence of a naturally-occurring electromotive force between a first probe in contact with the skin or subcutaneous portions of a body area to be diagnosed for the presence or absence of said malignant tissue, and a second probe which is maintained in contact with an area of normal body tissue, and recording as suspect, areas of malignant growth, at least those body areas which were in contact with said first probe when an electromotive force between −2.0 and −5.0 mv was measured, wherein said naturally-occurring electromotive force arises from an asymetrical distribution of metal atoms or ions about the suspected malignant tissue.

4,407,301

DISC MEMBRANE CATHETER FOR PERFORMING CYSTOMETROGRAMS AND URETHRAL PROFILES

Erwin Streisinger, Maplewood, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jan. 27, 1981, Ser. No. 228,984
Int. Cl.³ A61B 5/10
U.S. Cl. 128—774 14 Claims



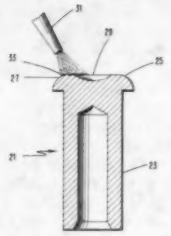
1. A diagnostic catheter for performing cystometrogram (CMG) and urethral pressure profile tests comprising a hollow shaft having a proximal end and a distal end, the distal end being closed, a CMG port in the shaft wall adjacent said distal end in communication with the proximal end of the shaft, an inflation outlet port in said shaft wall, an inflation lumen extending inside said shaft from said inflation outlet port to the proximal end of the shaft, a thin inflatable elastomeric member means located on the outside of said shaft and overlying said inflation outlet port and secured to said shaft about the periphery of said inflation outlet port and said means expandable outwardly only in the localized area proximal of said outlet port, and means for injection of fluid alternatively into the proximal end of the inflation lumen or to the CMG port, and means for measuring the back pressure from the same.

4,407,302

CARDIAC PACEMAKER ELECTRODE TIP STRUCTURE

Michael S. Hirshorn, Double Bay; Loraine K. Holley, Rockdale, and Michael Skalsky, Waverley, all of Australia, assignors to Telectronics Pty., Ltd., Lane Cove, Australia

Filed Apr. 6, 1981, Ser. No. 251,340
Int. Cl.³ A61N 1/04
U.S. Cl. 128—784 14 Claims



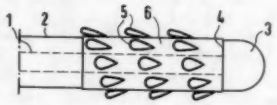
1. A pacemaker electrode having an electrode tip with an external conductive surface for contact with tissue to be stimulated, the improvement comprising means for increasing the microsurface area of said electrode tip to decrease the sensing impedance of said electrode tip, said increasing means comprising at least one roughened area formed on said external surface and at least one concave indentation formed in said external surface for contact with said tissue to be stimulated.

4,407,303

ENDOCARDIAL ELECTRODE ARRANGEMENT

Bengt Akerström, Täby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 9, 1981, Ser. No. 252,428
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1980, 3015260
Int. Cl.³ A61N 1/04
U.S. Cl. 128—785 14 Claims



1. An endocardial electrode arrangement for the intracardiac stimulation of the heart, comprising a conductor assembly including an elongated electric conductor having an electric insulation covering, and a distal end, an electrode head which is electrically conductively connected with the distal end of the conductor, serving the purpose of supplying stimulation pulses to the heart, and conductor assembly emplacement means for the placement of the conductor assembly on the heart wall, characterized in that, for the purpose of placement of the conductor assembly said conductor assembly emplacement means comprises loop means consisting essentially of soft, thin material, mounted on the conductor assembly in proximity to the electrode head, said soft, thin material forming loops on different sides of said conductor assembly each loop including two legs and a free end portion connecting the two legs, and the legs and free end portions of the respective loops projecting from the conductor assembly in respective different directions to facilitate emplacement of the conductor assembly by lifting of the loops from the conductor assembly and adherence of blood within the loops to a heart wall, the loop means being constructed so that the free ends of the loops can be lifted from the conductor assembly by a distance greater

than the thickness of said material as measured in a direction radially of the conductor assembly.

4,407,304

METHOD OF MOUNTING AN ELECTRICAL LEAD IN A CATHETER BODY

Clement E. Lieber; Robert P. Cooper, both of Yorba Linda, and Michael S. Estes, Irvine, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 160,600, Jun. 18, 1980, Pat. No. 4,329,993. This application Sep. 11, 1981, Ser. No. 301,146

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—786 5 Claims

1. A method of mounting an electrical lead in a catheter body having proximal and distal ends and having a plurality of parallel lumens therein, a first one of said lumens being adapted for containing a gas and separated by a longitudinal septum from a second lumen adapted for conducting a liquid; comprising the steps of forming a lateral port in the outer wall of said body at a point intermediate the length thereof, said port communicating only with said second lumen and constituting an opening for the inflow and outflow of a liquid with respect thereto; introducing a tool through said port to form an aperture in said septum, said aperture placing said first and second lumens in communication with each other; then positioning at least one electrical lead in said lumens so that a proximal portion of said lead is disposed in said first lumen on the proximal side of said aperture, a distal portion of said lead is disposed in said second lumen on the distal side of said aperture, and an intermediate portion of said lead extends through said aperture from one lumen to the other; and thereafter closing and sealing said aperture and said second lumen distal to said port by means of a sealant plug introduced through said port into said second lumen, whereby, liquid may thereafter flow through said second lumen between said port and the proximal end of said body without contacting said lead.

4,407,305

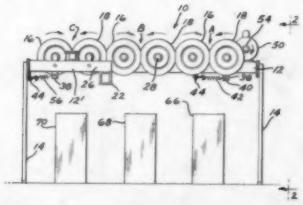
TOBACCO LEAF-STRIPPING MACHINE

Calvin D. Patterson, 5201 Bennett La., La Grange, Ky. 40031

Filed Aug. 18, 1982, Ser. No. 409,275

Int. Cl.³ A01D *45/16*

U.S. Cl. 130—31 R 14 Claims



1. A tobacco leaf-stripping machine comprising:

a. an elevated, elongated workbench including an integrated series of adjacent work stations;

b. each work station including a vertically adjustable guide member on which a tobacco stalk is to be rested in a generally horizontal position, as well as a pair of counter-rotating wheels arranged in a vertical plane on moving centers, said wheels being resiliently biased into rolling frictional contact with each other and centered with respect to the guide member, at least one wheel of each work station being in frictional contact with a complementary wheel of an adjacent work station; and

c. a single motor drive means for turning one of the wheels thereby causing all of the wheels in succession to turn, whereby the tobacco leaves are adapted to become pinched between the wheels of a particular work station and thereby caused to be pulled from the stalk and fall into a receptacle located beneath that particular work station.

4,407,306

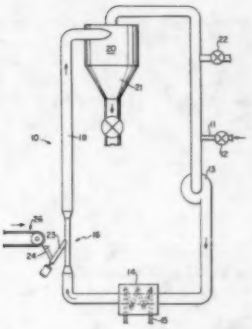
METHOD FOR EXPANDING TOBACCO WITH STEAM AT HIGH TEMPERATURE AND VELOCITY

Charles H. Hibbitts, Chester, Va., assignor to American Brands, Inc., New York, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,676

Int. Cl.³ A24B *3/18*

U.S. Cl. 131—296 3 Claims



1. A method for drying and expanding cut tobacco comprising

(a) providing a stream of gas including steam and air moving at a speed in excess of 100 ft./sec. at a temperature in the range of 500°–700° F. at about atmospheric pressure in an elongated conduit having first and second sections tandemly arranged with the first section having a reduced cross-sectional area so that as the gas passes through said reduced area the pressure at that area is decreased;

(b) introducing cut tobacco having 15–50% moisture content into such reduced pressure area of the first section of the conduit for high speed transport through the first and second sections;

(c) withdrawing the tobacco from the conduit after it has resided therein less than one half second.

4,407,307

PROCESS FOR THE PREPARATION OF TOBACCO AND TOBACCO PREPARED ACCORDING TO THIS PROCESS

Helmut Gaisch, Cormondreche; Patrick D. L. Ghiste, Boudry, and Dieter Schulthess, Neuchatel, all of Switzerland, assignors to Fabriques de Tabac Reunies, S.A., Neuchatel, Switzerland

Filed Jan. 7, 1982, Ser. No. 337,807

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100715

Int. Cl.³ A24B *3/18, 15/26*

U.S. Cl. 131—308 7 Claims

1. Process for the treatment of tobacco comprising the steps of:

(a) subjecting cured tobacco to aqueous enzyme treatment whereby insoluble protein components are decomposed into soluble fragments,

(b) separating the resulting solution from the tobacco residue, and

(c) subjecting the separated solution to microorganisms capable of metabolically assimilating the soluble protein fragments therein, thereby generating a biomass.

4,407,308

SMOKING ARTICLES

Richard R. Baker, Dibden Purlieu, and Federick J. Dashley, New Milton, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Mar. 1, 1982, Ser. No. 353,156

Claims priority, application United Kingdom, Mar. 6, 1981, 8107118

Int. Cl.[3] A24D *1/02*

U.S. Cl. 131—336 11 Claims

1. A smoking article comprising a rod of smoking material wrapped in a wrapper of which the air permeability due to viscous flow is substantially uniform and is, substantially, not more that 3 Coresta Units and of which the Do/t value is, substantially, in the range of 0.08 to 0.65 cm sec^{-1}.

4,407,309

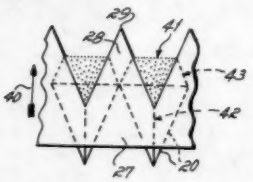
HAIR STYLING METHOD

James G. McFarland, 1106 Rainbow Trail, Milford, Ohio 45150

Filed Oct. 7, 1981, Ser. No. 309,259

Int. Cl.[3] A45D *24/36*

U.S. Cl. 132—45 R 1 Claim



1. The method of cutting or styling haircuts which comprises utilizing a generally flat, rigid, planar comb having multiple teeth, each tooth of which defines an included angle of between 15° and 75°, which method comprises

moving said comb in multiple strokes generally parallel to the contour of the head upwardly toward the crown of the head so as to force hair entrapped between pairs of said teeth of said comb into a crossed pattern as a consequence of said comb movement resulting in hair on the left side of a first tooth engaging and being forced leftwardly relative to that first tooth, while hair on the right side of an adjacent tooth located on the left side of said first tooth is forced to the right to create said crossed pattern of groups of hair entrapped between adjacent pairs of teeth of said comb, cutting said groups of hair entrapped between said teeth of said comb in a plane parallel to said comb so as to form said groups of cut hair into the configuration of truncated pyramids, the individual hairs of said truncated pyramids tending to fall across one another and thereby remain upstanding away from the scalp so as to retain a styled appearance.

4,407,310

SCULPTURED ARTIFICIAL NAIL

Henry C. Jadow, New York, N.Y., assignor to Kristy Wells, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 913,566, Jun. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 872,502, Jan. 26, 1978, abandoned. This application Jun. 6, 1980, Ser. No. 157,039

Int. Cl.[3] A45D *29/00*

U.S. Cl. 132—73 7 Claims

1. A method of forming an artificial nail comprising:

(a) adhesively bonding a granular material comprising methacrylate polymer granules to a substrate located in the position of a nail on a human finger by applying the granules to the substrate in the presence of sufficient cyanoacrylate glue to bond the particles to each other and to the substrate, for establishing on the substrate an adherent layer of bonded granules in which the granules impart depth to the layer and form an outwardly exposed granular surface; and

(b) shaping the produced artificial nail to simulate the appearance of a natural nail.

4,407,311

MAKE-UP UNIT WITH AN ADJUSTABLE WIPER DEVICE

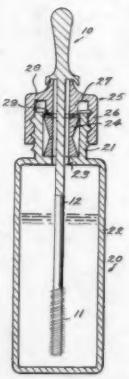
Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Oct. 19, 1982, Ser. No. 435,313

Claims priority, application France, Nov. 6, 1981, 81 20808

Int. Cl.[3] A45D *40/30*

U.S. Cl. 132—88.5 13 Claims



1. In a make-up unit comprising:

(a) a bottle for containing a make-up product, and having a barrel and a neck;

(b) an applicator;

(c) annular wiper means defining an adjustable opening capable of receiving said applicator, said annular wiper means being at least partly accommodated within the neck of the bottle; and

(d) movable manipulating means for variably deforming said

annular wiper means to vary the cross-section of its said opening; the improvement comprising:

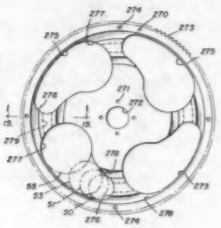
(e) a peripheral sliding element disposed between said movable manipulating means and the annular wiper means (24, 60) to avoid torsional deformation of the annular wiper means upon movement of said movable manipulating means.

4,407,312

FARE COLLECTION SYSTEM AND COMPONENTS THEREOF

Jose E. Davila, Bourbonnais, and Jim H. Gomez, Kankakee, both of Ill., assignors to General Railway Signal Company, Stamford, Conn.

Filed May 28, 1980, Ser. No. 153,912
Int. Cl.³ G07D 9/04
U.S. Cl. 133—8 R 19 Claims



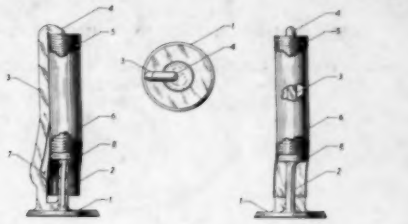
1. A coin singulating and counting device comprising a mounting plate, a coin sizing disk overlying said mounting plate and mounted for rotation with respect thereto, a transfer plate overlying said sizing disk and fixedly mounted with respect to said mounting plate, a coin singulator disk overlying said transfer plate and mounted for rotation with said sizing disk and with respect to said mounting plate and said transfer plate, means for rotating said singulator disk and said sizing disk with respect to said mounting plate and said transfer plate about an axis inclined to the horizontal, said coin singulator disk having at least one open bottom coin singulating pocket therein for receiving coins one at a time from a supply thereof to travel along a first predetermined path on the upper surface of said transfer plate, said transfer plate having an opening therein along said first path and shaped to receive a coin therethrough off said transfer plate and out of said singulating pocket at a predetermined point along said first path, said coin sizing disk having at least one arcuate open bottom coin sizing pocket therein for receiving coins of various sizes one at a time from said singulating pocket through the opening in said transfer plate to travel along a common second predetermined circular path on the upper surface of said mounting plate, said sizing pocket being elongated circumferentially of said second predetermined path and of increasing size in the direction of travel along said second predetermined path and shaped and arranged to receive a coin at a predetermined position therein in accordance with the size of the coin, said mounting plate having a coin exit opening therein along said second path and shaped to receive a coin therethrough off said mounting plate and out of said sizing pocket at a predetermined point along said second path, and mechanism for measuring the distance along said second path between a predetermined point on said sizing disk and the exit of a coin at said coin exit opening for detecting the size of the coin and for counting the coin as the coin passes into said coin exit opening.

4,407,313

COMBINED COIN SAVER, COUNTER AND WRAPPER

Gerard V. Ventura, 131 Richmond Ave., West Haven, Conn. 06516

Filed Feb. 20, 1981, Ser. No. 236,451
Int. Cl.³ G07D 9/06
U.S. Cl. 133—8 A 3 Claims



1. A combined coin saver, counter and wrapper comprising a base section having connected thereto a coin support and elongated arm having an upper portion, the base section being of sufficient size to support the coin support and elongated arm in vertical fashion on a horizontal surface, the coin support being of sufficient length extending above the base section and of sufficient diameter to allow a coin wrapper to slide freely on and off the coin support and having an enlarged top relative to its lower portion to support a stack of coins in column fashion, the elongated arm extending above the base section substantially perpendicular to the coin support and column of coins, and the upper portion of the elongated arm extending into the area to be occupied by the column of coins and diameter of the coin support at a height above the coin support so as to represent an exact count of column of coins inserted in a coin wrapper while it is around the coin support.

4,407,314

COMBINED COIN SAVER, COUNTER AND WRAPPER

Gerard V. Ventura, 131 Richmond Ave., West Haven, Conn. 06516

Filed Feb. 20, 1981, Ser. No. 236,452
Int. Cl.³ G07D 9/06
U.S. Cl. 133—8 A 10 Claims

1. A combined coin saver, counter and wrapper comprising a hollow elongated member of sufficient diameter to retain a plurality of coins in straight column fashion in a coin wrapper, said elongated member mounted on a base section containing a coin support having a push means slideably mounted thereon, said push means positioned so as to contact the bottom of the coin wrapper and raise the wrapper while leaving the coin stack stationary, said coin support extending into the inner diameter of the elongated member at a sufficient height to maintain a specific count of the column of coins coextensive with the top of the elongated member when resting on the base section, the diameter of the elongated member being of sufficient size to allow the coin wrapper to freely slide around the

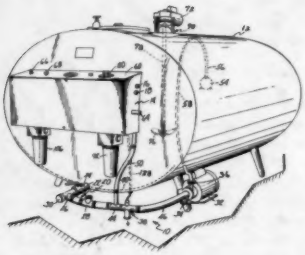
column of coins, and the push means slideably mounted on the coin support so that when in its uppermost position, excess coin wrapper extends equidistant above the top of the elongated member when resting on the base and below the top of the coin support.

4,407,315

APPARATUS FOR CLEANING INTERIOR OF A MILK TANK

Merle D. Haberer, 4057 Main St., Bowdle, S. Dak. 57428

Filed Jun. 12, 1981, Ser. No. 272,911
Int. Cl.³ B08B 9/08
U.S. Cl. 134—58 R **5 Claims**



1. A tank cleaning apparatus for cleaning an interior of a milk tank in a plurality of cleaning cycles, each cycle characterizing a separate cleaning step in which a separate quantity of cleansing fluid is used, and the tank having an outlet proximate a bottom interior surface thereof, the system comprising:

three-way valve means permanently attached to the outlet of the tank, said three-way valve means being operable between a first closed condition wherein milk cannot pass out of the tank outlet, a milk removal condition whereby milk can pass out through the tank outlet and a portion of the three-way valve means to a location for use thereof, and a tank cleaning condition whereby there is a cleansing fluid opening through said three-way valve means from an interior of said tank through said tank outlet to a cleansing fluidds recirculation conduit;

means for supplying a measured quantity of the cleansing fluid to the recirculation conduit supplying the cleansing fluid to the recirculation conduit downstream of the cleansing fluid opening of the three-way valve means;

pump means having an inlet end open to said cleansing fluid recirculation conduit for receiving cleansing fluid from the means for supplying, said pump means being positioned downstream of the cleansing fluid opening of the three-way valve means;

the milk tank having means for dispersing the fluid within the interior of the tank against interior surfaces and the tank having an outlet proximate a bottom interior surface thereof, a dispersing means supply conduit open from an outlet side of said pump means to said dispersing means within the interior of said tank;

a solenoid operated drain valve in said recirculation conduit between said cleansing fluid opening of the three-way valve means and said pump means inlet, said drain valve having a drain outlet opening at a low point of said recirculation conduit and below said tank outlet, said three-way valve means and said pump means inlet; and

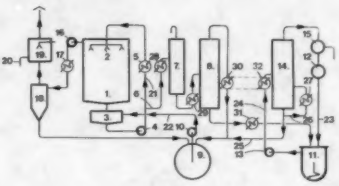
control means operable to control the length of each cycle, the operation of said pump means and the drain valve such that the pump means recirculates the cleansing fluid during each cycle and the drain valve opens draining the fluid at the end of each cycle.

4,407,316

CLEANING INSTALLATION

Ernest Ihringer, Chemin du Liaudoz, 9 CH-1009 Pully, Switzerland

Filed Aug. 20, 1981, Ser. No. 294,564
Claims priority, application Switzerland, Aug. 21, 1980, 6307/80
Int. Cl.³ B08B 3/02
U.S. Cl. 134—104 **6 Claims**



1. Installation for cleaning parts of machines and pieces of all types which have been exposed to jets of paint by means of a water-miscible organic solvent having a boiling point higher than that of water, comprising a treatment chamber operating under reduced pressure, in which said parts and pieces to be cleaned are exposed to jets of hot solvent, said chamber being directly or indirectly connected to devices for recovering and for recycling said solvent, a ventilator mounted on a gas outlet conduit from said treatment chamber, said ventilator connected to a cyclone by means of a refrigerating heat exchanger.

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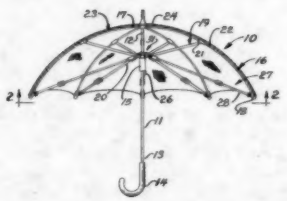
UMBRELLA REVERSAL PREVENTION STRUCTURE

Melvin Crandall, 4207 W. Howard St., Skokie, Ill. 60076

Filed Mar. 16, 1981, Ser. No. 244,158
Int. Cl.³ A45B 25/22
U.S. Cl. 135—27 **10 Claims**



1. For use with an umbrella having a shaft defining an outer end and an inner end, an annular runner coaxially longitudinally movable on the shaft, a plurality of resilient ribs having inner ends connected to said outer end of the shaft and outer ends, a plurality of rigid ribs having inner ends connected to said runner and outer ends connected one each to midportions of said resilient ribs, a flexible sheet cover having a midportion secured to said shaft outer end and a peripheral portion secured to said resilient ribs outer ends, and means for releasably retaining said runner in a disposition wherein the rigid ribs urge the resilient ribs to an inwardly bowed configuration with the cover defining an inwardly concave configuration, the improvement comprising:

a plurality of flexible guys each having an inner end and an outer end, the outer ends of said guys being connected one each to different ones of said resilient ribs outer ends;

means for connecting the inner ends of said guys to said shaft at said shaft outer end; and

adjusting means associated with each of said guys for fixedly

adjusting the length thereof to provide a preselected tension in each guy for effectively preventing undesirable displacement of the resilient rib outer ends outwardly from the normal disposition thereof in said bowed configuration thereby to prevent reversal of the inwardly concave configuration in use of the umbrella as from a high wind forced directed outwardly against said cover, said adjusting means comprising means including a first portion comprising means for repetitively adjusting the length of the guys to accommodate changes in the umbrella parameters due to weather conditions, relaxation of the umbrella components, and the like, and a second portion providing a permanent strap length fixation permitting adjustment of the guys by said first portion in both lengthening and shortening directions as desired, said guys comprising straps, said first portion of the adjusting means comprising a buckle including a loop member defining a center opening and a crosspiece extending across said opening to divide said center opening into a pair of strap-passing openings, said outer end of the strap being secured to said crosspiece and including portions extending sequentially through said strap-passing openings, said outer end of each strap including a first portion passed in a first direction through a first of said strap-passing openings, thence in an opposite direction through the second of said strap-passing openings, and thence in said distal portion thereof connected to said outer end of the resilient rib, and a second portion extending back from said distal portion, in said first direction through said second of said strap-passing openings, in said second direction through said first of said strap-passing openings, and thence to the connection to said crosspiece, said distal portion of the strap being retained in an adjustable loop by a releasable holding element encircling said first and second portions adjacent said distal portion.

4,407,318

STICK

Joseph H. Stuever, Oklahoma City, Okla., assignor to Sierra Survival Company, Inc., Ada, Okla.

Filed Sep. 21, 1981, Ser. No. 303,779
Int. Cl.³ A45B 7/00
U.S. Cl. 135—66 **31 Claims**

1. An improved stick comprising:

a plurality of section assemblies having opposite ends, each section assembly comprising:

a section body being cylindrically shaped and having an outer peripheral surface with an external diameter (D-1), opposite ends and a section body opening extending through the section body and intersecting at least one of the ends, a portion of the section body opening forming a storage compartment and the section body opening forming an internal wall having an internal diameter (D-2);

two collars for each section body, each collar being cylindrically shaped and having opposite ends and a collar opening extending through the collar and intersecting the opposite ends, the collar opening forming an internal peripheral annular wall and having an internal diameter (D-3) greater than the external diameter (D-1) of the section body, one end of each section body being insertable a distance into the collar opening in one of the collars and the opposite end of each section body being insertable a distance into the collar opening in one of the other collars in a connected position of the collars and the section body; and

a plurality of connector assemblies for removably connecting one end of one section assembly to one end of another section assembly, each connector assembly comprising:

a connector assembly body having opposite ends, an internal storage compartment formed in a portion thereof and adapted for storing items and an access opening formed in a portion of the connector assembly body providing access to the storage compartment, one end of the connector assembly body being removably connectable to one end of one of the section assemblies and the opposite end of the connector assembly body being removably connectable to one end of another section assembly for removably connecting the section assemblies in an end-to-end relationship in a connected position of the connector assembly and the section assemblies; and

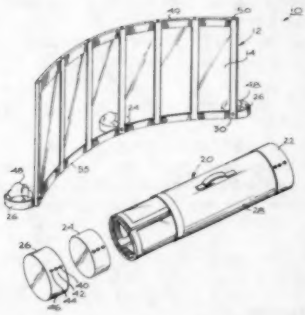
a cap removably connectable to the connector assembly body generally near the access opening, the cap being shaped to close the access opening in the connected position of the cap to the body.

4,407,319

WIND SHELTER

George W. Shultz, and Nouelle A. Shultz, both of P.O. Box 611 431 N. Canyon, Camino, Calif. 95709

Filed Nov. 23, 1981, Ser. No. 323,973
Int. Cl.³ A45F 1/00; E04F 10/04
U.S. Cl. 135—87 **1 Claim**



1. A wind shield having at least one frame portion and a pane portion carried within said at least one frame portion, said frame portion having an upper and a lower member joined by side members;

at least one ballast container having a back portion, said back portion having at least one securing aperture therein;

a securing button carried in said lower member of said frame portion and protruding therefrom;

said at least one securing aperture being dimensioned to cooperate with said securing button for easy application and removal of said ballast container to and from said lower member of said at least one frame portion;

said frame portion being flexible along its upper and lower

members and said pane portion being flexible whereby said wind shield may be rolled about an axis normal to said upper and lower members of said frame portion;

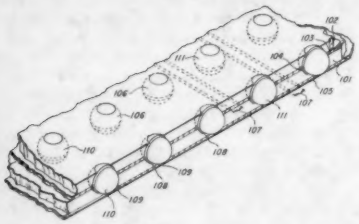
said wind shield including, in addition, a tube, having a length adequate to receive said wind shield, the number of said ballast containers is at least two and such ballast containers are shaped and dimensioned to form end caps for said tube.

4,407,320

LARGE AREA, FAULT TOLERANT SOLAR ENERGY CONVERTER

Jules D. Levine, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 8, 1981, Ser. No. 299,695
Int. Cl.³ H01L *31/04, 31/18*
U.S. Cl. 136—250 **23 Claims**



10. A radiant energy converter system comprising:

a. a plurality of substantially spherical semiconductor cells of a first conductivity type having a surface layer doping of a second conductivity type over a portion of the surface of each cell;

b. aluminum foil bonded to each of said cells in like conductivity regions;

c. conductive means making electrical contact to each cell in regions of opposite conductivity from those contacting said aluminum foil; and

d. insulating means for electrically separating said conductive means from said aluminum foil.

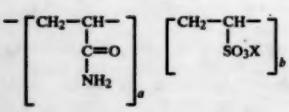
4,407,321

DRAG REDUCING AGENTS

Hans Wilski, Bad Soden am Taunus; Werner Interthal, Rüsselsheim, and Friedrich Engelhardt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 30, 1980, Ser. No. 173,638
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931707
Int. Cl.³ F17D *1/16*
U.S. Cl. 137—13 **4 Claims**

1. Process for reducing the friction pressure drop of aqueous liquids and suspensions in turbulent or pulsating flow by adding from 1 to 1,000 ppm of a drag reducing agent, which comprises using as the drag reducing agent a linear random copolymer of the following formula I



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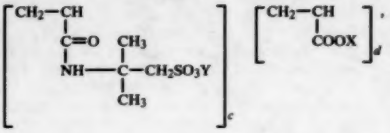


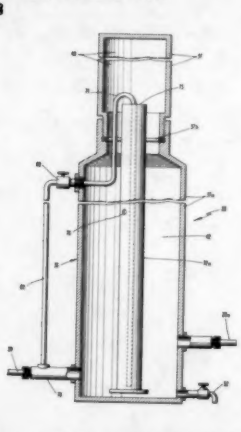
in which X is in a Na^+, K^+ *or* NH_4^+ cation and Y is hydrogen or Na^+, K^+ or NH_4^+ cation, and in which a, b, c and d represent the proportional weight ratios of the comonomers in % and a is in the range of from 30 to 98, b from 0 to 20, c from 0 to 25 and d from 0 to 45, however, wherein the sum of the portions of b and c must be at least 2, the said copolymer being obtained by a polymerization reaction without stirring in an about 15 to 40% by weight aqueous solution, the reaction being started at an initial temperature of about 10° to 30° C. and completing the reaction at about 60° to 95° C. resulting in a polymer in the form of an aqueous, dimensionally stable jelly which has retained a solubility in water and is capable of being cut and which has an elastic resilience of more than 5%.

4,407,322

CHEMICAL FEEDER

Stephen D. Moore, 1230 - 17th Ave. N., Lake Worth, Fla. 33460, and Murrill Maglio, 305 Cypress Ave., West Palm Beach, Fla. 33406

Filed Dec. 2, 1980, Ser. No. 212,105
Int. Cl.³ B01D *11/02*
U.S. Cl. 137—268 **5 Claims**



1. A device for controlled, pressure-actuated feeding of a water-soluble chemical into a water line having a pressure varying between a minimum and a maximum in the line, comprising:

an input coupling to the water line;

a first check valve for preventing flow back through said input coupling;

an output coupling to the water line downstream from said input coupling;

fluid-tight chemical mixing tank means in fluid communication between said input and output couplings for permitting mixing of the chemical and the water therein, said mixing tank means including an elongated vertical cylinder divided into sealingly engageable upper and lower sections, chemical storage means, and a chemical and water mixing chamber, said storage means and said mixing chamber being situated within the cylinder, said fluid communication including fluid passage means through at

least a portion of said chemical storage means and into said mixing chamber; and

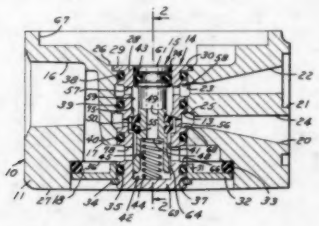
means for creating a pressure differential between said mixing tank means and said output coupling as a result of a decrease in the water pressure in the line below the maximum, thereby forcing chemical and water from said tank means into the line via said output coupling, said pressure differential creating means including an air reservoir situated in said mixing tank means and a control valve between said tank means and said output coupling, said control valve being set at a restricted flow value with respect to said input coupling, whereby the contents of said tank means are fed through said control valve by the pressure in said air reservoir acting on said contents when the water pressure in the water line decreases below the pressure in said air reservoir, both said chemical storage means and said mixing chamber being subject to the pressures of said air reservoir, wherein said air reservoir is primarily in said upper section; and wherein said chemical storage means is an elongated vertical container extending from near the bottom of the mixing chamber upward through the lower section and into the upper section of the cylinder, said container having an aperture in the wall thereof lying within said lower section and adapted to be within the fluid of said chemical and water mixing chamber during a portion of each filling cycle of said chamber and a tube having its rim at one end sealed to the perimeter of said aperture and the other end of said tube extending close to the bottom of said container.

4,407,323

CARTRIDGE TYPE PILOT VALVE

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

Filed Mar. 1, 1982, Ser. No. 353,045
Int. Cl.³ F16K *25/00*
U.S. Cl. 137—454.2 **7 Claims**



1. A three-way, normally closed only, pilot air valve including a valve body with a pressurized pilot air inlet port, a cylinder port, and an exhaust port, characterized in that:

(a) said valve body has a bore formed therethrough;

(b) a one-piece tubular valve retainer member, having an axial bore formed therethrough, is releasably mounted in said valve body bore in a position between the inlet port, the cylinder port, and the exhaust port, and it has a tubular side wall and an upper end and a lower end;

(c) a first passageway means is formed through the valve body and the tubular valve retainer member and it connects said pressurized pilot air inlet port to the cylinder port;

(d) a second passageway means is formed through the valve body and the tubular valve retainer member and it connects said exhaust port to the cylinder port;

(e) a first circular sharp edged poppet valve seat is formed in the tubular valve retainer member axial bore in the first passageway means, and a second circular sharp edgeds poppet valve seat is formed in the tubular valve retainer member axial bore in the second passageway means;

(f) a poppet valve spool is movably mounted in said tubular valve retainer member axial bore and movable between a normally closed inoperative position and an open operative position;

(g) said poppet valve spool is provided with a first conical annular valve member element and a longitudinally spaced apart second conical annular valve member element for sealing engagement with the first and second circular sharp edged poppet valve seats, respectively, so that when the poppet valve spool is in the normal inoperative position the first conical annular valve member element is seated on the first circular sharp edged poppet valve seat and the poppet valve spool blocks communication through the first passageway means between the inlet port and the cylinder port through the tubular valve retainer member axial bore while simultaneously the second conical annular valve member is in the unseated position, with communication open between the cylinder port and the exhaust port through the tubular valve retainer axial bore to allow the air under pressure entering said cylinder port to be exhausted out said exhaust port, and when the poppet valve spool is moved to the operative open position the second conical annular valve member element is seated on the second circular sharp edged poppet valve seat and the poppet valve spool blocks communication through the second passageway means, to block exhausting of air from the cylinder port to the exhaust port, and the first conical annular valve member element is unseated to open communication between the pilot air inlet port and the cylinder port through the first passageway means to allow pressurized pilot air to flow from the pilot air inlet port to the cylinder port;

(h) the poppet valve spool is normally biased to the normally closed inoperative position by means which includes a return spring means mounted in the lower end of the tubular valve retainer member axial bore and engaged with the lower end of the poppet valve spool; and,

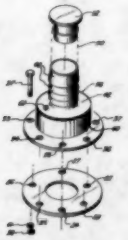
(i) retainer means releasably secures the tubular valve retainer member in the valve body bore.

4,407,324

VALVE STEM COVER APPARATUS

John P. Caddell, 2310 W. George, Zachary, La. 70791

Filed Feb. 17, 1981, Ser. No. 234,920
Int. Cl.³ F16K *27/08*
U.S. Cl. 137—382 **3 Claims**



1. An apparatus for protecting hand operable valves having a hand wheel attached to a valve stem forming a handwheel and stem assemble, comprising:

a. a valve stem cover having means for securely attaching said cover to the hand wheel and stem assembly and having an open ended nipple section on its upper end for receiving the valve stem therethrough, said nipple section upper end having a plurality of laterally projecting ribbed edges;

b. a tubular flexible rubber-like sleeve section attachable to said nipple at a first end by frictionally engaging said nipple at said ribbed edges forming a connection between

said edges and said first end, the tubular section-nipple connection being a slip-on/off quick release connection;

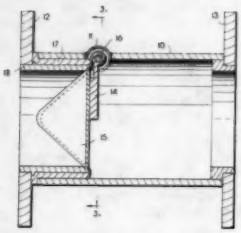
c. means for enclosing the second end of said tube section to encapsulate with said tube, and said cover, the valve stem.

4,407,325

ARCUATE SWING CHECK VALVE

George S. Cherniak, 246 21st Pl., Santa Monica, Calif. 90402

Filed Nov. 9, 1981, Ser. No. 319,806
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—514 16 Claims



1. In a swing check valve having a body portion defining a fluid passage therethrough, a valve seat mounted in said body, a pivot member supported by said body, a pivotable sealing member rotatable around said pivot pin for engaging said valve seat for closure of the fluid passage when flow is in one direction and movement away from the valve seat when flow is in the opposite direction, the improvement comprising: said valve seat having non-planar sealing surfaces developed by forming a circular arc through the horizontal diametral plane of a tubular member and extending tangent planes from that arc to the periphery at the intersection of the vertical diametral and the transverse end planes of said member and said pivotable sealing member having an arcuate, saddle shaped configuration with non-planar sealing surfaces mating with those of the valve seat developed by forming a circular arc tangent to the horizontal diametral plane of a corresponding tubular member and extending tangent planes from that arc to the periphery of the member, meeting the periphery at points on the vertical diametral plane spaced apart the outer diameter of the tubular member.

4,407,326

VALVE ACTUATING MECHANISM

Raymond L. Wilhelm, Orange, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 29, 1981, Ser. No. 287,982
Int. Cl.³ F16K *37/00, 31/44*
U.S. Cl. 137—553 18 Claims

1. A valve actuating mechanism including value position indicating means, comprising:

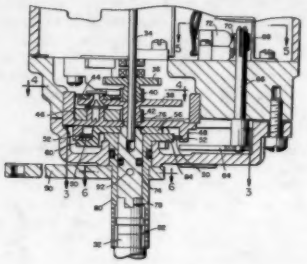
drive means for moving said valve including power means, drive train means from said power means and operated thereby, and output means from said drive train means to said valve;

valve position indicating means;

moving means for moving said valve position indicating means in response to operation of said drive train means, said moving means being operatively associated with said output means;

clutch means operatively associated between said drive train means and said output means and said moving means for operating said output means and for deactivating said drive train means in response to said valve position indicating means reaching a predetermined indicating position and thereby stopping said moving means; and

override means in said output means operatively associated with said clutch means through said moving means for deactivating said drive train means in response to malfunc-



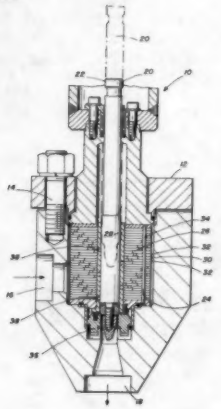
tioning of said valve and thereby prevent movement of said valve indicating means.

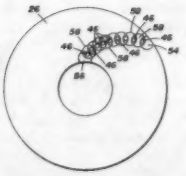
4,407,327

FLOW CONTROL VALVE

Lloyd D. Hanson, and Robert M. Purton, both of Cerritos, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 24, 1981, Ser. No. 256,876
Int. Cl.³ F16K *47/12, 47/14*
U.S. Cl. 137—625.3 5 Claims





1. An improved pressure control valve including a body having an inlet and an outlet, a valve seat encircling said outlet, a valve member movable in a longitudinal direction in said body toward and away from said seat, and orifice means located in said body between said inlet and outlet and cooperable with said valve member to control flow through said outlet, said orifice means comprising:

a perforated sleeve member located in said body and encircling a portion of said valve member whereby movement of said valve member opens and closes said perforations;

a plurality of orifice discs encircling said sleeve member, each said orifice disc having a plurality of radially and circumferentially spaced orifices extending therethrough;

a plurality of spacer discs encircling said sleeve member in alternating stacked relation with said orifice discs, each said spacer disc having a plurality of radially and circumferentially spaced flow ports extending therethrough, each said port being larger than each said orifice and in fluid communication with at least one of said orifices; and,

each said orifice and spacer disc located in radially displaced position relative to each other serially arranging said ports and orifices forming a multiplicity of elongated curvilinear flow paths through said discs extending generally longitudinally of said valve for dissipating the energy of fluid flowing through said valve.

4,407,328
CLUTCH-BRAKE STEERING MECHANISM FOR TRACTORS

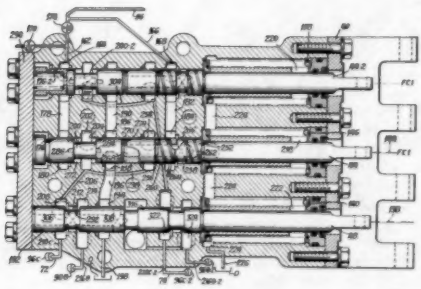
Daniel B. Shore, Niles, and Probir K. Chatterjea, Mount Prospect, both of Ill., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 10,568, Feb. 9, 1979, Pat. No. 4,308,893, which is a division of Ser. No. 708,956, Jul. 26, 1976, Pat. No. 4,164,276, which is a division of Ser. No. 561,119, Mar. 24, 1975, Pat. No. 4,015,619. This application Apr. 9, 1981, Ser. No. 252,533

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.³ F15B *13/06*

U.S. Cl. 137—625.6 **8 Claims**



1. For use in a pressure fluid system including hi pressure, lo pressure, and metered pressure outlet conduits:

signal-pressure setting valve assembly means (**40**) with a common bore (**176**) therein hydraulically disposed for communicating with said conduits and controllably connecting the hi and lo pressure conduits for producing an actual metered outlet pressure in the outlet conduit in correspondence with a signal pressure as set;

first (**44**) and second (**200**) independently slideable members in the common bore, each having a double spool portion for establishing the respective signal and actual pressures, and having a pressure pickup port intermediate the double spools of each for such signal and actual pressures;

means providing a path of flow along a restrictive orifice (**262,264**) of appreciable length formed along the double spools (**252, 260**) of the first member, in communication with the signal pressure pickup port (**266**) thereof, said path of flow covered by companion sections of the bore so as to fix a generally uniform pressure gradient therealong between hi and lo pressures;

means forming along double spools (**274, 276**), of the second member a path (**286, 272, 284**) of flow covered by said bore and arranged to provide an actual pressure, metered output therefrom, in communication with its actual pressure pickup port (**278**) and with the output from said path under pressure between hi and lo pressures; and

means for communicating (**272**) said output under pressure to and through said metered pressure outlet conduit;

said members each, notwithstanding varying pickup port pressures, constantly changing positions with independent sliding movement thereby maintaining an actual metered outlet pressure in said outlet conduit that is directly related to said signal pressure.

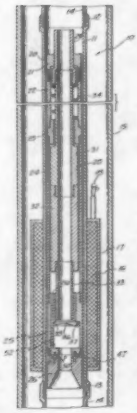
4,407,329
MAGNETICALLY OPERATED FAIL-SAFE CUTOFF VALVE WITH PRESSURE EQUALIZING MEANS

Donald L. Huebsch, 3716 Prestwick Dr., Los Angeles, Calif. 90027, and Louis B. Paulos, 9616 Yolanda Ave., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 140,188, Apr. 14, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,355

Int. Cl.³ E21B *43/12*

U.S. Cl. 137—629 **66 Claims**



1. A magnetically operated valve assembly adapted to be opened by equalizing the pressure differential thereacross comprising:

a tubular housing adapted to be installed in tubing in communication with pressurized fluid at one end;

cutoff valve means supported crosswise of the interior of said housing movable to an open position providing a linear flow passage which is unobstructed from end to end of said valve assembly;

electric coil means coiled concentrically of said tubular housing;

tubular first armature means of magnetic material in axial alignment with said flow passage through said tubular housing, said armature means being reciprocably supported within said coil means and movable between the extended and retracted positions thereof and operable to open said cutoff valve means when the pressure thereacross is substantially equalized; and

pressure equalizing valve means across small passage means having its opposite ends in communication with the opposite sides of said cutoff valve means and including second armature means of magnetic material positioned to be energized by said coil means and responsive thereto to open said pressure equalizing valve means and thereby effective to equalize the pressure differential across said cutoff valve means.

4,407,330

PRESSURE PULSE ABSORBING DEVICE

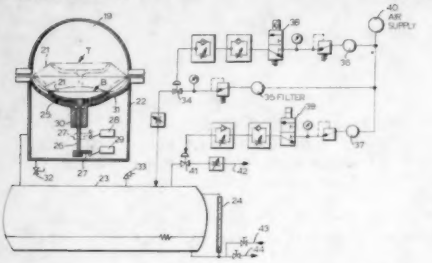
Haruyoshi Fujiwara, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

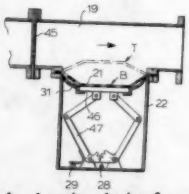
Continuation of Ser. No. 116,604, Jan. 24, 1980, abandoned. This application Jan. 26, 1982, Ser. No. 342,920

Claims priority, application Japan, Feb. 2, 1979, 54-11299

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **7 Claims**





1. A pressure pulse damping device for use in a liquid passage, said damping device comprising:

a flexible diaphragm made of an easily deformable material having a small mass and adapted to cover an opening in a bottom wall of the liquid passage, the edge of said diaphragm being adapted to be fixed relative to the wall of the liquid passage;

a chamber beneath said diaphragm and to the interior of which the side of said diaphragm opposite the side facing the liquid passage faces, supporting means supporting said diaphragm between said chamber and said liquid passage for permitting at least a portion of said diaphragm to move out of and into said chamber perpendicular to the plane of the opening and in a radial direction of said liquid passage toward and away from the liquid passage, said supporting means being constituted by a support frame for said diaphragm, said support frame being attached to a portion of said diaphragm and positioned adjacent to the side of said diaphragm opposite the side facing the liquid passage, a support rod fixed to said support frame and extending radially outward from the liquid passage, and a porous plate defining a wall of said chamber for communicating said chamber with said diaphragm, said porous plate having a bore therethrough for radially slidably accommodating said support rod, whereby when the average pressure in the liquid passage is greater than that in said chamber said support rod moves away from the liquid passage and when the average pressure in the liquid passage is less than that in said chamber said support rod moves toward the liquid pressure;

gas contained in said chamber at a pressure equal to the average pressure of the liquid in the passage;

a gas supply means connected to said chamber for providing said chamber with gas whenever at least a portion of said diaphragm reaches a predetermined limit of radial movement away from the liquid passage;

a gas discharge means connected with said chamber for discharging gas from said chamber whenever at least a portion of said diaphragm reaches a predetermined limit of radial movement toward the liquid passage;

means for sealingly closing said chamber whenever said diaphragm moves toward and away from the liquid passage within the range between said limits of radial movement; and

the total capacity of said chamber and said gas supply means being such that the change of shape of said diaphragm in response to a pulse of liquid in said passage causes a change in the pressure of said gas just sufficient to keep the pressure of the liquid in said liquid passage constant.

4,407,331

SPEED REGULATOR FOR THE WARP BEAM OF A WEAVING MACHINE

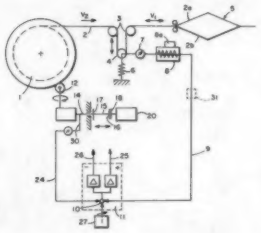
Walter Rehling, Poststrasse 63, Holzwickede, Fed. Rep. of Germany 4755, and Jaime Rossell, 10, Chemin du Valloni, Lausanne-Pully, Switzerland CH-1012

Filed Sep. 15, 1980, Ser. No. 186,943

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939607

Int. Cl.³ D03D *49/06, 49/10*

U.S. Cl. 139—110 **5 Claims**



1. A speed regulator for a warp beam of a weaving machine comprising:

variable speed drive means for accelerating or breaking a rate of rotation of a warp beam;

means for generating a voltage output proportional to a deflection of a dancer which receives warp thread from a warp beam associated with said drive means;

integrator means for counting and averaging said voltage outputs and generating an averaged voltage representing a desired voltage value;

tachometer means connected to said drive means for generating a voltage proportional to said rate of rotation of a warp beam and representing an actual voltage value; and

regulator means operatively connected to said drive means, said integrator means and said tachometer means for receiving said desired voltage value and said actual voltage value, comparing said voltage values, and selectively actuating said drive means in response to said voltage values to accelerate or brake a rate of rotation of an associated warp beam and thereby maintain tension of an associated warp thread substantially constant.

4,407,332

WEAVERS PLATFORM ASSEMBLY AND CLOTH GUIDE

William J. Alexander, III, 41 W. Golden Strip Dr., Mauldin, S.C. 29662

Filed Aug. 5, 1981, Ser. No. 290,145

Int. Cl.³ D03D *49/20*

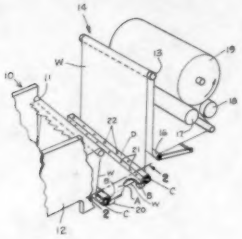
U.S. Cl. 139—304 **2 Claims**

1. A weavers platform assembly and cloth guide for use with a cloth takeup for a loom comprising:

a horizontal walkway having sides extending transversely

between said loom and said cloth takeup having an intermediate portion between ends of said walkway in elevated position to accommodate the passage of cloth therebeneath from the loom to the takeup;

an upright side flange extending along said walkway on each of said sides extending substantially entirely therealong and having integral connection with said sides;



a hollow tubular member having a smooth anti-friction outer wall carried by the upright flanges and having fixed connection with respect thereto;

a portion of said hollow tubular member extending beneath said intermediate portion of said walkway over which said cloth passes for sliding guidance between said loom and said cloth takeup; and

said hollow tubular member extending outside said flanges along the entire length thereof.

4,407,333

BELTING FABRIC

Robert A. Fowkes, Newtown, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,396
Int. Cl.³ D03D *11/00*
U.S. Cl. 139—415 5 Claims

1. A belting fabric, comprising:

upper and lower parallel planar arrays of relatively closely adjacent, substantially uncrimped, parallel warp cords;

upper, lower and middle parallel planar arrays of substantially uncrimped parallel weft cords extending transversely to said warp cords, said upper array of weft cords and said lower array of weft cords being located, respectively, above said upper array of warp cords and below said lower array of warp cords at the exterior surfaces of the fabric, and said middle array of weft cords being located between said upper and lower arrays of warp cords;

the spacing between adjacent weft cords in each of said arrays of weft cords being greater than the spacing between adjacent warp cords in each of said arrays of warp cords, the spacing between adjacent ones of said upper weft cords being substantially equal to the spacing between adjacent ones of said lower weft cords, and the spacing between adjacent ones of said middle weft cords being approximately one-half the spacing of adjacent ones of either said upper or said lower weft cords;

each of said upper weft cords, viewed as lying in a vertical plane, being located substantially midway intermediate two adjacent ones of said lower weft cords, viewed as lying in respective vertical planes, and vice versa, and each of said middle weft cords, viewed as lying in a vertical plane, being located substantially midway intermediate one of said upper weft cords and an immediately adjacent one of said lower weft cords;

a plurality of pairs of upper binder cords extending in the warp direction of the fabric and passing, respectively, intermediate selected pairs of adjacent ones of said upper warp cords, and a plurality of pairs of lower binder cords extending in the warp direction of the fabric and passing, respectively, intermediate selected pairs of adjacent ones of said lower warp cords;

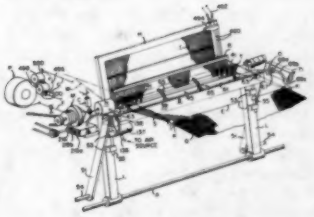
the two binder cords of each of said pairs of upper binder cords being interlaced jointly with each of said upper weft cords and, intermediate each two adjacent upper weft cords, singly each with only a respective one of the two middle weft cords located intermediate those two adjacent upper weft cords, and the two binder cords of each of said pairs of lower binder cords being interlaced jointly with each of said lower weft cords and, intermediate each two adjacent lower weft cords, singly each with only a respective one of the two middle weft cords located intermediate those two adjacent lower weft cords.

4,407,334

METHOD AND APPARATUS FOR POSITIVELY REMOVING WEFT FROM AIR INSERTION GUIDANCE TUBE

Charles W. Brouwer, East Greenwich, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Aug. 6, 1979, Ser. No. 64,021
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 9 Claims



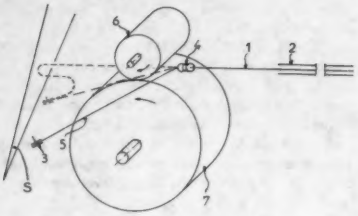
1. In the method of weaving in which a weft strand is projected in substantially free flight into the warp shed of a loom and is guided while in flight across at least a portion of the shed by a plurality of guides disposed in operative position within the shed in interdigitating relation with said warp threads, said guides being moved to and fro along an arcuate path to withdraw them between warp threads to an inoperative position substantially entirely outside the shed and then to return the same within the shed, said guides each having an opening at a common point to permit the projected strand to egress therefrom and remain within the shed during their withdrawal from the shed, the steps of (a) engaging the weft strand after said flight at spaced points along its length while the strand is within said shed and within said guides and (b) bodily displacing the strand laterally outwardly through said egress opening in said guides before said guides are withdrawn from said shed.

4,407,335

PROCESS AND DEVICE FOR THE INSERTION OF A WEFT THREAD INTO THE SPACE BETWEEN TWO LINES OF WARP THREAD

Albert Moessinger, Chemin de l'Eglise Epalinges, 1066 Vaud, Switzerland

Filed Jan. 27, 1981, Ser. No. 228,952
Claims priority, application France, Jan. 30, 1980, 80 02316
Int. Cl.³ D03D 47/36
U.S. Cl. 139—452 11 Claims



1. A process for inserting a weft thread into the space between two layers of warp thread in a weaving loom, the process comprising:

storing in a storage space a specific length of weft thread with one end free,

gripping the stored weft thread at a locking point situated at a distance measured from the free end of the thread, which is at least equal to the pick of weft thread to be inserted,

casting the thread in the shape of a loop into the space between the two layers of warp thread, said loop having one cast strand and one locked strand, and the casting being produced by squeezing the thread between two casting rollers which rotate in opposite directions and which are positioned between the locking point of the locked strand and the free end of the cast strand so that the kinetic energy of the cast strand produces a force which pulls the thread from where it unwinds,

inserting the weft thread between the casting rollers by moving a length of weft thread between a guiding point situated upstream of the common generatrix of the casting rollers and the locking point which is situated downstream of said common generatrix laterally to the common generatrix

so that the weft thread at the time of the casting operation is moved into position between the casting rollers at their common generatrix so that, once cast, the thread moves along the common generatrix to form a loop between the locking point and the cast strand by driving the length of thread out of the storage space.

4. Device for inserting a weft thread into the shed formed by the warp threads in a weaving loom, the device comprising:

means for storing in a storage space a specific length of weft thread with one end free,

a guide for directing said weft thread,

a pair of casting rollers for casting the weft thread into the shed in the shape of a loop with one strand locked and one strand cast by imparting kinetic energy to the thread for the thread to unwind it from the storage space wherein said casting rollers are positioned so that they have a common generatrix downstream of the guide,

a clip arranged downstream of the common generatrix so that the weft thread when laterally moved towards the common generatrix will form an angle with the common generatrix, and

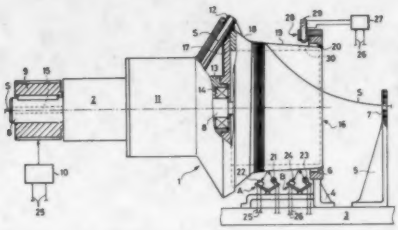
insertion means adapted to laterally move the length of weft thread between the clip and the guide into position at one end of the common generatrix of the casting rollers.

4,407,336

THREAD-FEED DEVICE FOR TEXTILE MACHINES AND METHOD OF OPERATION

Alois Steiner, Rieden, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Jun. 16, 1981, Ser. No. 274,217
Claims priority, application Switzerland, Jun. 17, 1980, 4642/80
Int. Cl.³ B65H 47/01
U.S. Cl. 139—452 16 Claims



1. A thread-feed device for textile machines having a stationary winder drum onto which a thread fed from a stationary winding bobbin can be wound by means of a rotatable winder arm for the formation of a thread supply and the thread supply formed can be withdrawn on top, and having a first detection device for automatically controlling the rotary movement of the winder arm as a function of the length of the supply of thread formed, characterized by:

a. a second detection device arranged in the region of the withdrawal end of the winder drum to give a first signal upon each passage of the thread during its withdrawal through its monitoring region,

b. a control unit arranged behind the second detection device for the counting of the first signals and the giving off of a second signal as soon as the number of first signals reaches a predetermined adjustable value corresponding to the required length of thread, and

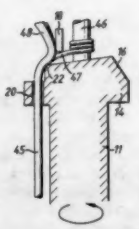
c. a thread gripper means which is operably connected to the control unit and can be controlled by the second signal.

4,407,337

WIRE WRAPPING TOOL FOR WRAPPING INSULATED WIRE

Howard E. Hines, Ipswich; Rex F. G. Hardy, Woodbridge, and David S. Butler, Saxmundham, all of England, assignors to Post Office, London, England

Continuation of Ser. No. 140,561, Apr. 15, 1980, abandoned. This application Aug. 10, 1982, Ser. No. 406,882
Claims priority, application United Kingdom, Apr. 17, 1979, 7913245
Int. Cl.³ B21F 3/04
U.S. Cl. 140—124 6 Claims



1. A wire wrapping tool comprising a wrapping head

adapted for rotation relative to a wrapping post, said head having separate cutting and separate stripping means for removing insulation from a wire and means for guiding wire to be wrapped to said cutting and stripping means, characterized in that the cutting means comprises a cutting edge defined on said head and the stripping means comprises a stripping element disposed downstream from the cutting edge such that in use the wire passes over the cutting edge before reaching the stripping means, the cutting edge and stripping element being arranged generally transverse to the direction of movement of the wire, and the cutting edge being arranged to form a straight longitudinal cut in the insulation on the wire prior to it being stripped by the stripping element.

4,407,338

METERING OF PASTE ONTO A CARRIER TAPE

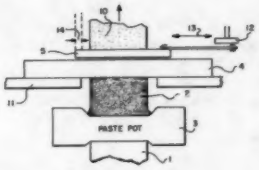
Klaus Kleinsorgen, Kelkheim, and Erich Münch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Dec. 18, 1980, Ser. No. 217,760

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952234

Int. Cl.³ B65B *3/04*; H01M *4/82*

U.S. Cl. 141—1 **5 Claims**



1. A method of metering paste applied to a tape-like carrier material, in which the metering takes place by means of a scraper device, said method comprising

moving the scraper relative to the paste without contacting the tape and the edge of the scraper nearest the tape is spaced from the tape by a predetermined distance which is less than the thickness of the applied paste, so that said scraper projects into the thickness of said applied paste,

oscillating said scraper in a plane parallel to the tape, and

performing the movement of said scraper at a speed which equals at least the tear velocity between the scraper and the paste.

4,407,339

DOUBLE-WALLED HOLLOW ROD OF FLEXIBLE TUBULAR MATERIAL

Armin Köstner, Wiesbaden; Richard Lenhart, Wiesbaden-Frauenstein, and Klaus-Jürgen Bittner, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 914,158, Jun. 9, 1978, Pat. No. 4,273,551, which is a continuation-in-part of Ser. No. 413,622, Nov. 7, 1973, abandoned. This application Sep. 22, 1980, Ser. No. 189,477

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1972, 2254731

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—10 **8 Claims**

1. A process for the manufacture of a tubular package filled with pasty material which comprises

(a) positioning a filling tube of a filling device inside the inner tube of a tubular rod of flexible material, said rod comprising an inner tube substantially free from folds and a shirred outer tube, the hollow space of said shirred outer tube constituting a casing for said inner tube and said inner tube being a deshirred length of the tubular rod which is inverted into the hollow space of said shirred outer tube thus forming a double-walled rod, wherein the outside surface of said inner tube and the inside surface of said outer tube are in direct contact, the inner tube being integral with the outer tube at one of its ends and sealed at the other; in a manner such that the filling tube adjoins the seal of the rod, and

(b) feeding pasty material from the filling device through the filling tube into said inner tube of the rod, and simultaneously turning the tube forming the shirred stick inside out under a frictional contact between the outside surface of the deshirred inner tube and the inside surface of the shirred outer tube, whereby the shirred outer tube is progressively unfolded by the pressure exerted in introducing the pasty material.

4,407,340

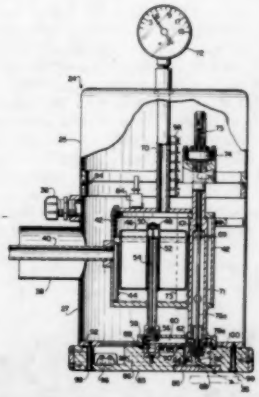
CONTAINER PRESSURIZATION SYSTEM

Eric L. Jensen, and Harry W. Lee, Jr., both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 217,773, Dec. 18, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 362,671

Int. Cl.³ B65B *31/00*

U.S. Cl. 141—67 **8 Claims**



1. Apparatus for pressurizing containers comprising a source of liquified gas, means for adjusting pressure within said liquified gas source, means for detecting said containers and injector means responsive to said detecting means to supply liqui-

fied gas to said containers, said injector means comprising an intake line in fluid flow relation with said liquified gas source, a chamber in fluid flow relation with said intake line, a float positioned within said chamber, a tube over which said float rides and in fluid flow relation with said chamber, a first valve having a valve stem connected to said float and connected in fluid flow relation to said chamber through said tube, a second valve in fluid flow relation with said chamber for releasing said liquified gas into said containers and means for controlling said second valve.

4,407,341

APPARATUS FOR REMOVING CONTENTS OF DAMAGED AEROSOL CONTAINERS

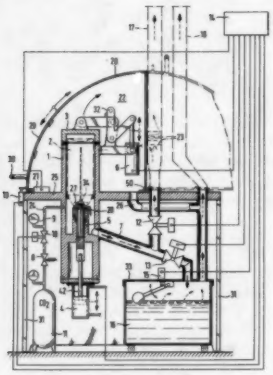
Adolf Feldt, Gross Hansdorf; Ulrich Jarnuszak, Tangstedt; Rolf Kiessling, and Juergen Kock, both of Hamburg, all of Fed. Rep. of Germany, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 11, 1981, Ser. No. 262,671

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018795

Int. Cl.³ B65B *3/04*; B67B *7/20*

U.S. Cl. 141—97 **14 Claims**



1. An apparatus for safely emptying aerosol spray cans filled with active ingredient and flammable gaseous propellant which have valve inserts for spraying the active ingredients comprising an explosion-proof casing with a cap, said casing being mounted in a table and being covered by a pivotable bonnet which in its closed position presses down a locking contact which blocks locking means controlling the opening of said bonnet, a discharge pipe connected to the lower end of said casing, a first valve means for venting the gaseous propellant from said discharge pipe to a suction channel, a second valve for draining off the liquid active ingredient from said discharge pipe to a collecting container, clamp means sealed in explosion-proof manner passing through the base of said casing and which is movable relative to said casing for breaking the seal between the spray can placed in said casing and its valve insert, and an automatic control circuit to control said first and second valves, said clamp means, and said bonnet.

4,407,342

TOOL FOR WOOD DOWEL STRIATION

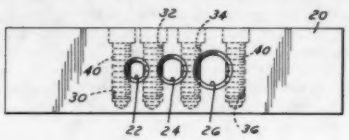
Frederick R. Deaner, Hamilton, N.Y., assignor to Eaton Industries, Inc., Eaton, N.Y.

Filed May 28, 1981, Ser. No. 267,735

Int. Cl.³ B27M *3/28*

U.S. Cl. 144—2 R **2 Claims**

1. A tool for forming striations in a wooden dowel by lineal pressing the outer surface of the dowel which comprises a block having a transverse hole extending through the block to receive axially a dowel, a metal shank having spaced crested annular ridges such as a screw shank extending into said block on an axis perpendicular to the axis of said hole and on each side of said hole, the axes of said shanks being spaced relative



to the axis of said hole so that the annular ridges extend into the sides of the said hole,

whereby when a dowel is forced endwise into and through said hole, said ridges will press axial creases into the surface of said dowel.

4,407,343

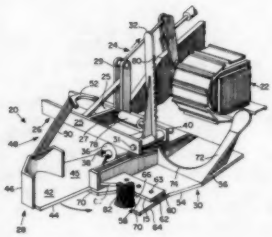
TREE FELLER WITH GRAVITATIONAL BUNCHER

Harry E. Brown, Perry, Fla., assignor to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Continuation of Ser. No. 99,242, Dec. 3, 1979, abandoned. This application Jun. 2, 1982, Ser. No. 408,372

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—34 E **17 Claims**



1. A vehicle-mounted tree harvesting machine comprising:

(a) bunching means for accumulating felled trees and including a trough adapted to support and selectively grip the cut ends of the trunks of said trees while the tree tops are supported by the ground, said bunching means being located adjacent one side of said vehicle;

(b) a front feeding shear mounted forward of said bunching means, said shear being supported for movement along a generally horizontal arcuate path from an open position to a closed position, said shear having a cutting edge adapted to cut through a tree as the shear moves towards the closed position, said cutting edge being generally perpendicular to the length of the vehicle in its closed position; and

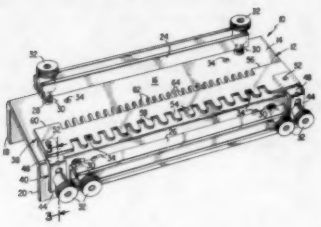
(c) pushing means mounted on said front feeding shear, said pushing means being adapted to engage a tree above and spaced from the cutting edge of said shear as it cuts through the tree and apply rearward force to initially direct the fall of such tree toward the trough of said bunching means, the tree thereafter completing the fall into said trough principally by gravity acting on such tree, said shear, said pushing means, and said bunching means being aligned so that the falling trees do not land on the vehicle.

4,407,344

DOVETAIL FIXTURE

William C. Dicke, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 284,878
Int. Cl.³ B27F 1/14, 1/10
U.S. Cl. 144—87 1 Claim



1. Dovetail fixture for guiding a cutting tool in cutting mortises and tenons is provided which can be simply used in cutting mortises and tenons at either of two selectable pitches, comprising a base equipped with a horizontal table defining a first work receiving surface and a vertical apron defining a second work receiving surface adapted to support a pair of work pieces in orthogonal abutting relation, a first clamping means adapted to clamp one work piece against said first work receiving surface, a second clamping means adapted to clamp the other work piece against said second work receiving surface, a cutter guiding template having one of its edges formed with a first series of alternating guide fingers and slots at a first pitch and having a second, opposite edge formed with a second series of alternating guide fingers and slots at a second pitch, the template being adapted to overlie one of the work pieces and to be clamped thereupon in a position such that the outer edges of one selected set of slots and fingers is in alignment with the outer surface of the work piece, and a pair of L-shaped angle support brackets pivotally mounted to the template, each support bracket being mounted to the template by means of a single screw generally on the longitudinal center line of the template between the slotted edges so as to be pivotal therearound, each bracket also being selectively mountable on said base to thereby enable selective positioning of the desired series of slots and fingers in tool guiding position.

4,407,345

VENEER LATHE WITH CORD EMBEDDING KNIFE

Kaisuji Hasegawa, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Apr. 2, 1981, Ser. No. 250,178
Claims priority, application Japan, Apr. 14, 1980, 55-49920
Int. Cl.³ B27L 5/02
U.S. Cl. 144—211 6 Claims

1. A veneer lathe for turning a log to cut off veneer sheet from said log comprising

means for supporting a log to permit said log to rotate about its axis in a predetermined direction;

a veneer cutting knife having a straight edge tangentially oriented relative to the periphery of said log and adapted to counteract the log rotation to cut off a veneer sheet from the log; and

a cord embedding knife having an edge extending in a plane intersecting said straight edge of the veneer cutting knife, said cord embedding knife being provided on a rake face side of the veneer cutting knife to cut into the log upstream of the edge of said veneer cutting knife to form an elongated cut in the veneer sheet cut off from said log and to place a length of cord in said elongated cut,

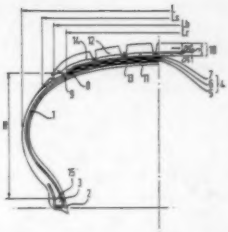
part of said knife extending downstream of said edge of the veneer cutting knife to restrain firmly said length of cord in the elongated cut.

4,407,346

PNEUMATIC TIRE FOR MOTOR VEHICLES HAVING A LOW POWER ABSORPTION AND A HIGH DIRECTIONAL CONTROL STABILITY

Paolo Bandel, Milan, and Renato Caretta, Viale dei Tigli, both of Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Dec. 1, 1980, Ser. No. 211,843
Claims priority, application Italy, Dec. 12, 1979, 7221 A/79
Int. Cl.³ B60C 1/00, 3/00, 11/00
U.S. Cl. 152—209 R 7 Claims



1. A pneumatic tire for vehicle wheels which comprises a radial cord carcass, two sidewalls which determine the section width of the tire, two beads each of which comprises at least one bead core, said radial carcass cords being wound around aid bead core, a tread disposed on the carcass top, a circumferentially substantially inextensible annular reinforcing structure radially interposed between said tread and said carcass, said annular reinforcing structure having a width which is substantially equal to the width of the tread and having its lateral edges lying at the tread shoulders, said tread comprising two layers of different rubber compositions which are radially superimposed one on the other, the radially innermost layer being formed of a composition which has an index of hysteretic loss not higher than 0.010 Joule for each cubic centimeter of composition at a temperature of 25° C. and not higher than 0.006 Joule for each cubic centimeter of composition at a temperature of 70° C. and a modulus of elasticity at an elongation of 100 percent of from 20 to 30 kg per square centimeter, the ratio between the radial distance of the lateral edges of said annular reinforcing structure from the radially outermost point of the bead core, and the width of the tire section being smaller than 0.6.

4,407,347

PNEUMATIC TIRE

Henri J. Mirtain, Compiegne, France, assignor to Pneu Uniroyal Englebert, Clairoix, France

Filed Jan. 13, 1978, Ser. No. 869,397
Claims priority, application France, Feb. 7, 1977, 77 03378
Int. Cl.³ B60C 9/20
U.S. Cl. 152—361 FP 8 Claims

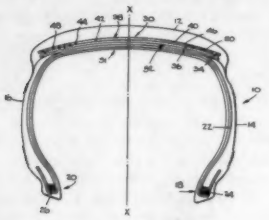
1. A pneumatic tire comprising:

(a) a carcass;

(b) a tread portion connected to said carcass; and

(c) a reinforcement belt assembly peripherally enclosing said carcass beneath said tread portion and being substantially coextensive with said tread portion, said reinforcement belt including:

(i) a first layer of at least one ply of tire cord fabric containing cords having a high modulus of elasticity, at least one ply of said first layer being of a width substantially equal to that of the tire tread; and



(ii) a second layer of at least one composite ply superimposed upon said first layer, including a central strip portion of metal tire cord fabric in which the cords are oriented at an angle of between 60° to 90° with the equatorial plane of the pneumatic tire and two lateral strips of tire cord fabric which abut said central strip, the cords of said lateral strips possessing a low modulus of elasticity.

4,407,348

MULTI-PIECE WHEEL STRUCTURE

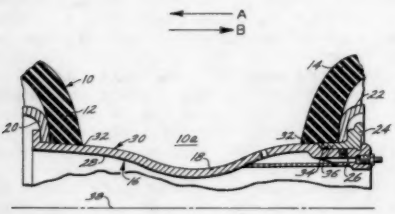
David S. Suckow, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00092, § 371 Date Jan. 23, 1981, § 102(e) Date Jan. 23, 1981

PCT Filed Jan. 23, 1981, Ser. No. 278,510

Int. Cl.³ B60B *25/08, 25/18*

U.S. Cl. 152—410 **9 Claims**



1. A wheel structure (16) for a tire (10) comprising:

an annular rim base (18) disposed about a longitudinal axis (19) and having an inner periphery (28) and an outer periphery (39), said outer periphery (30) including a tire mounting surface (32) which is engageable with both beads of a tire and a locking surface (34), said locking surface (34) bounding a locking indentation (36) and being disposed radially nearer said longitudinal axis (19) than said mounting surface (32);

an annular restraining flange (22) disposed about said rim base (18);

a locking ring (24) which is receivable in said locking indentation (36) and is engageable with said locking surface (34) and said restraining flange (22) to prevent axial movement of said restraining flange (22) in a first direction (B);

first means (44,46) for providing fluid communication between the atmosphere and a tire's interior (10a) when a tire (10) is mounted on said tire mounting surface (32);

second means (52) for providing fluid communication between said first fluid communication means (44,46) and said locking surface (34); and

means (26) for obstructing fluid communication through said second fluid communication means (52) when said locking ring (24) is engaged with said locking surface (34).

4,407,349

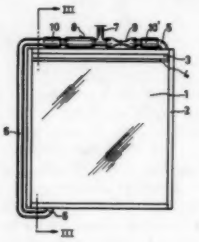
SHIELDING WINDOWS

Lars A. Ekström, Djursholm, Sweden, assignor to Raywall Kommanditbolag, Marsta, Sweden

Filed Mar. 30, 1981, Ser. No. 249,088

Int. Cl.³ A47H *1/00*; E06B *3/32*

U.S. Cl. 160—98 **6 Claims**



1. A window shield for multi-pane windows comprising a window frame, at least two window panes sealingly mounted at their edges in spaced relationship in said frame to provide a sealed space between said panes and said frame, a piston means disposed within said space in sliding engagement with the inner sides of said panes and oppositely disposed sections of said frame so that said piston means is movable through substantially all of said space, said piston means having a cross-section corresponding to the cross-section of said space, an extendable and retractable shield member within said space mounted at one end to said frame and at the other end to said piston so that said movement of said piston through said space moves said shield member between its retracted position and its extended position, said retracted position being located adjacent one end of the path of movement of said piston, storage means to store said shield in the retracted position, a first conduit connected to said space on one side of said piston means, a second conduit connected to said space on the other side of said piston means, valve means operably connected to said conduits to selectively direct pressurized air to one side of said piston means and relieve the pressure on the other side of said piston means to operate said piston means to selectively extend or retract said shield means, and a source of pressurized air operably connected to said valve means.

4,407,350

APPARATUS FOR STRETCHING AND LINKING A VERTICAL BLIND SLAT-CLOTH

Toshihiro Nakamura, Tokyo, Japan, assignor to Toso Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,721

Claims priority, application Japan, May 13, 1981, 56-67971[U]

Int. Cl.³ E06B *9/38*

U.S. Cl. 160—178 R **7 Claims**

1. Apparatus for stretching and linking a vertical blind slat-cloth comprising a weight of a metallic plate, a weight-case of a synthetic resin material for housing said weight together with the bottom part of a slat-cloth, said weight-case having narrowly spaced front and rear walls, widely spaced both side walls, and a bottom wall to define a thin inside space with a top

opening, said inside space and said top opening being slightly wider than the slat-cloth, a top guide integrally formed with said weight-case and connected to said both side walls with the intervention of flexible supports, said top guide being formed with a slit slightly wider than the slat-cloth, said support being

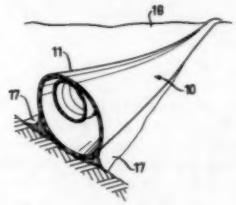
forwardly and rearwardly bendable, a pair of legs integrally formed with said weight-case and projecting from either of said top guide and said weight-case, a pair of coupling pins integrally formed with said weight-case, and couplers secured to linking cords each being adapted to be removably connected to said coupling pin.

4,407,351

METHOD FOR HEAT ABSORPTION FROM A SEA BOTTOM OR THE LIKE

Erik L. Backlund, Frösön, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 22, 1982, Ser. No. 370,816
Claims priority, application Sweden, Apr. 24, 1981, 8102618
Int. Cl.³ F28F *13/14*
U.S. Cl. 165—1 **1 Claim**



1. A method of heat absorption by means of a pipe conduit laid down on a sea bottom or the like, wherein heat from the bottom and the ambient water is emitted to a working fluid in the conduit, wherein in order to prevent said conduit from floating up from said bottom due to ice-formation, one or more upper or lateral portions of the flow cross-section are heat-insulated against the ambient water, so that ice-formation, if present, is restricted to the bottom side of said conduit to freeze fast said conduit to the bottom, wherein the heat insulation is achieved in that the working fluid in the conduit is caused to stand-still or imparted with a laminar flow in said upper and lateral portions of the flow cross-section and imparted with a turbulent flow in the remaining portion of the flow cross-section.

4,407,352

HIGH EFFICIENCY COKE OVEN REGENERATOR CHECKER BRICK

Donald J. Gerber, Glenshaw, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 6, 1982, Ser. No. 375,444
Int. Cl.³ F28D *17/00*
U.S. Cl. 165—9.1 **6 Claims**

1. A high efficiency coke oven regenerator checker brick, composed of refractory material, comprising:

(a) a vertical front wall, the external face of which is formed of a set of alternate vertical concave and convex radii configurations;

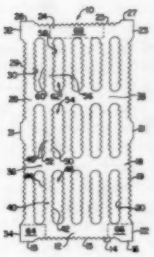
(b) a vertical right side wall, having a greater length than said vertical front wall and projecting rearwardly from the right edge of said front side wall at about a 90° angle, the external and internal faces of which are formed of a set of alternate vertical concave and convex radii configurations;

(c) a vertical rear wall, being equal in length to said vertical front wall and projecting to the left from the rear edge of said right wall at about a 90° angle and running parallel to said front side wall, the external face of which is formed of a set of alternate vertical concave and convex radii configurations;

(d) a vertical left side wall, being equal in length to said vertical right side wall and forming a connection between the left edges of said rear side all and said front wall, projecting from each at about a 90° angle, the external and internal faces of which are formed of a set of alternate vertical concave and convex radii configurations;

(e) forward and rearward intermediate vertical parallel transverse walls perpendicularly connecting said right side wall with said left side wall and spaced at approximately equal intervals, respectively, from said front and rear walls and from one another at a like equal interval;

(f) at least four longitudinal, vertical forward separator walls running parallel to and interposed between said right and left side walls and connecting said front wall and said



forward transverse wall and having right and left faces which are formed of a set of alternate vertical concave and convex radii configurations and said front longitudinal separator walls forming with themselves and with the internal faces of said right and left side walls at least five forward longitudinal slots;

(g) at least four longitudinal, vertical medial separator walls running parallel to and interposed between said right and left side walls and connecting said forward and rearward transverse walls and having right and left faces which are formed of a set of alternate vertical concave and convex radii configurations and said medial longitudinal separator walls forming with themselves and with the internal faces of said right and left side walls at least five medial longitudinal slots;

(h) at least four longitudinal, vertical rearward separator walls running parallel to and interposed between said right and left side walls and connecting said rear wall and said rearward transverse wall and having right the left faces which are formed of a set of alternate vertical concave and convex radii configurations and said rearward longitudinal separator walls forming with themselves and with the internal faces of said right and left side walls at least five rearward longitudinal slots; and

(i) means, fixed to said checker brick, for elevating said checker brick above an object upon which said checker brick is placed, allowing a horizontal open space between said checker brick and said object upon which said checker brick is placed.

4,407,353

WASTE HEAT RECOVERY DEVICE FOR PREVENTING CORROSION BY SULFUR OXIDES

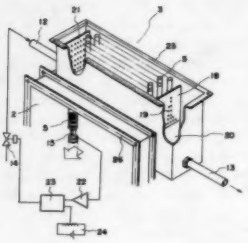
Tstomu Nakamura, Tokyo; Takashi Nakamoto, Matsudo; Tatuo Asada, Kawasaki; Kozo Taneda, Kodaira; Mitsuo Oshiro, Tokyo; Shigetoshi Takasu, Tokyo, and Masao Kurihara, Yono, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido and Suzuki Metal Industry Co., Ltd., Tokyo, both of, Japan

Filed Oct. 29, 1981, Ser. No. 316,429

Claims priority, application Japan, Nov. 17, 1980, 55-161778

Int. Cl.³ B60H *1/00*; B61D *27/00*

U.S. Cl. 165—39 **4 Claims**



1. A waste heat recovery device for preventing corrosion by sulfur oxide, comprising a heat pipe which is mounted at a heat-receiving side for receiving heat of exhaust gas at one end and which is mounted to a liquid heating section for heating a liquid supplied at the other end, a sensor mounted at the heat-absorbing side of said heat pipe for detecting the temperature of said heat pipe, flow rate controlling means for controlling a flow rate of the liquid supplied to said liquid heating section in response to a differential signal between an output signal from said temperature detecting sensor and a signal representing a dew point of the sulfur oxide, and a liquid discharging means for controlling a level of liquid in said liquid heating section in correspondence to the flow rate of the liquid supplied.

4,407,354

VEHICLE TEMPERATURE CONTROL APPARATUS

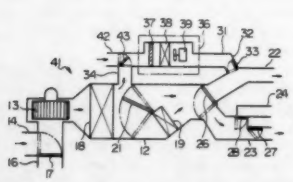
Takashi Takishita; Shinji Sutoh; Noriyuki Tanaka; Takashi Kobayashi, and Kenji Furukawa, all of Konan, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed May 12, 1980, Ser. No. 148,843

Claims priority, application Japan, May 18, 1979, 54-67117[U]

Int. Cl.³ B60H *3/06, 1/00*

U.S. Cl. 165—42 **5 Claims**



1. A temperature control apparatus for an automotive vehicle including a main duct means having an upper outlet for introducing air into the upper part of the vehicle passenger compartment, heating means disposed in the main duct means, bypass duct means having an outlet which communicates with the upper outlet and air filter means disposed in the bypass duct means, characterized in that the bypass duct means comprises a warm air inlet;

the bypass duct means further comprising a cold air inlet which communicates with the main duct means upstream of the heating means.

4,407,355

METHOD AND APPARATUS FOR DECREASING THE HEAT AND MATERIAL EXCHANGE IN THE DIRECT VICINITY OF THE WALLS OF FLUIDIZED BED REACTORS

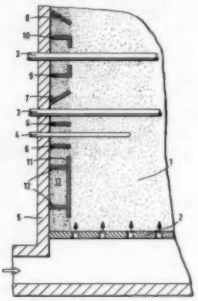
Berhard Bonn, Essen; Franz Giertz, Ratingen; Lothar Holl, Essen, and Heinz Schreckenberg, Brilon, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 242,127

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009198

Int. Cl.³ F28D *13/00*

U.S. Cl. 165—104.16 **3 Claims**



1. Apparatus for decreasing the heat, impulse and material exchange in the direct proximity of the walls of a fluidized bed reactor, comprising rib-shaped sheetlike components with a preferred horizontal extension sticking out of the interior reactor walls and operative for increasing resistance to flow of the fluid conducted through the fluidized bed in the vicinity of the walls so that whirls in said proximity of the walls are avoided, wherein the distance of the components away from said interior wall in the direction of flow of the fluid is at most about half as great as the height of said components, lateral thereto, and wherein for the protection of the walls or for heat insulation of the fluidized bed reactor, the fluidized material is used.

2. Apparatus for decreasing the heat, impulse and material exchange in the direct proximity of the walls of a fluidized bed reactor, comprising rib-shaped sheetlike components with a preferred horizontal extension sticking out of the interior reactor walls and operative for increasing resistance to flow of the fluid conducted through the fluidized bed in the vicinity of the walls so that whirls in said proximity of the walls are avoided, wherein the components are disposed parallel to the reactor wall and form with it a slit, and wherein for the protection of the walls or for heat insulation of the fluidized bed reactor, the fluidized material is used.

4,407,356

PORTABLE QUICK CHILLING AND HEATING APPLIANCE

Bruce E. DeLau, 7111 Marshall Ave., Hammond, Ind. 46323

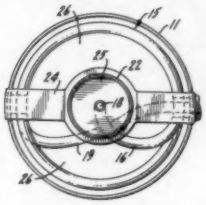
Filed Mar. 9, 1981, Ser. No. 241,677

Int. Cl.³ F28D *7/02*

U.S. Cl. 165—132 **1 Claim**

1. A portable quick chilling and heating appliance for fluids such as beverages comprising, in combination:

(a) a fluid tight container open at the top and adapted to rest upon a relatively flat support;
(b) a coil of metallic tubing wound in a generally helical configuration about an upstanding axis coinciding substantially with that of said container and having an upper end portion and a lower end portion;
(c) the convolutions of said helical configuration being of a diameter enabling them to be disposed in spaced relation with the inner peripheral wall of said container;
(d) a plurality of rigid spacers fixed to the inner peripheral wall of said container and disposed in positive abutting engagement with said coil to retain same in spaced relation with said inner peripheral wall;
(e) the upper end portion of said coil extending radially and axially of said coil so as to terminate at an intake situated above the top of said container;



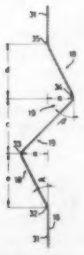
(f) the lower end portion of said coil extending radially outward and passing through the wall of said container in fluid tight relation therewith;
(g) an outlet valve connected to said lower end portion of said coil;
(h) a reservoir connected in fluid tight relation to said intake;
(i) a support structure for said reservoir connected to said container and disposed in spaced relation above the helical configuration of said coil; and
(j) said support structure comprising a bridge connected across the open end of said container and defining therewith at least one aperture for loading ice or a heating medium into said container, said loading aperture being situated between said reservoir and the helical configuration of said coil.

4,407,357

THIN SHEET METAL HEAT EXCHANGER

Karl S. H. Hultgren, Rosengarden, S-560 41 Mullsjö, Sweden

PCT No. PCT/SE80/00118, § 371 Date Dec. 23, 1980, § 102(e) Date Dec. 3, 1980, PCT Pub. No. WO80/02322, PCT Pub. Date Oct. 30, 1980
PCT Filed Apr. 22, 1980, Ser. No. 220,028
Claims priority, application Sweden, Apr. 23, 1979, 79035358
Int. Cl.³ F28F *3/04*
U.S. Cl. 165—165 **12 Claims**



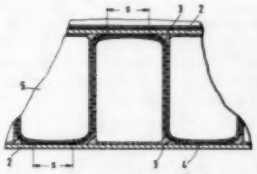
1. Heat exchanger for countercurrent heat exchange between two separated flowing media, consisting of a number of slots with common separating walls of thin sheet metal, preferably aluminium sheet metal, provided with profiles which cross each other on adjacent separating walls and form spacer means at the crossing points, characterized in that its heat exchanger surfaces are formed by the two sides of the separating walls (**16**) common to the two media, that the profiles consist of a ridge (**18**) and a depression (**19**) and are arranged at an angle (γ) in relation to the intended direction of flow through the heat exchanger, the profiles (**17**) on each individual separating wall (**16**) running parallel with each other with intermediate flat sheet metal portions (**31**), and that a ridge on one side of the separating wall corresponds to a depression on its other side, the the height (a) of the ridges (**18**) above the flat sheet metal portions (**31**) corresponds to half the depth of the depressions (**19**), measured from the top of one ridge to the bottom of the adjacent depression, that the distance (e) between the foot (**32**) of the ridge and its top (**33**) in the plane of the flat sheet metal portion (**31**) is the same for the ridges on both sides of the separating wall, whereby the angle (α), which the ridge forms with the flat sheet metal portion in the flow direction, will be the same on both sides of the separating wall, and that the portion of the separating wall which extends from the top (**33**) of the ridge to the bottom (**34**) of the depression forms an angle (β) with the flat sheet metal portion (**31**) in the flow direction which is adapted in relation to the Reynolds number at which the heat exchanger is to be used, so that circulation but not turbulence occurs in the depression at said Reynolds number.

4,407,358

LIGHT-WEIGHT CROSS-FLOW HEAT EXCHANGER UNIT

Herbert Muellejans, Stuttgart, and Hans-Joachim Koetz, Nuertingen, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 33,075, Apr. 25, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,071
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1978, 2817990
Int. Cl.³ F28F *3/10*
U.S. Cl. 165—166 **7 Claims**



1. A cross-flow heat exchanger unit, comprising:
a plurality of stacked film elements, each said film element corrugated to form a series of alternating ridges and grooves, and said film elements arranged in alternating layers in which said ridges and grooves of each said film element extend substantially transversely to said ridges and grooves of an adjacent said film element;
a substantially flat divider element interposed between each pair of adjacent said film elements, said film and divider elements having contacting surfaces which tough each other and non-contacting surfaces which do not contact each other;
means for bonding together said stacked film elements and said interposed divider element or elements, said bonding means comprising a coating of curable, synthetic resinous material on the non-contacting surfaces of said film and divider elements, which coating completely covers the non-contacting surfaces of at least said film elements to bond said film and divider elements together;

whereby a mechanically rigid heat exchanger block is formed.

4,407,359

PLATE HEAT EXCHANGER

Raymond Berger, Grenoble; Maurice B. de Cachard, La Tronche; Alain Collet, Beaurepaire; Didier Costes, Meudon; Andre Gouzy, Saint Ismier; Guy Dupuy, Beaurepaire; Pierre Caunes, Sassenage, and Claude Chevrier, Meylan, all of France, assignors to Commissariat a l'Energie Atomique and Alusuisse France S.A., both of, France

Filed Jul. 22, 1981, Ser. No. 285,748

Claims priority, application France, Jul. 25, 1980, 80 16472; Apr. 2, 1981, 81 06641

Int. Cl.³ F28F *3/08*

U.S. Cl. 165—167 **14 Claims**

1. A plate heat exchanger comprising a stack of appropriately spaced parallel plates having a central exchange area and two parallel borders which, by their stacking, form two distributor blocks, whereby in a block distribution takes place for one space out of each pair by directly issuing on to the face of the stack and for the other space of each pair by issuing on to a line of passages obtained by perforations elongated in the direction of the flow of fluids from one distributor block to the other and which face one another throughout the stack, wherein the planes of the parallel borders of the plates are displaced on either side of the plane of the central exchange area in such a way that when the stack of plates is formed, one of the borders of one plate is in planar contact with the border of the plate immediately above it, whilst the other border of said plate is in planar contact with the border of the plate immediately below it leading to a concertina structure sealing alternate spaces in each distributor block and wherein the borders of the perforations of the passages are deformed in the direction opposite to the displacement of the border with respect to the central area so as to come into contact with the border of the perforation of the passage in the adjacent plate, the planar contact between the parallel distribution borders extending to the part of the regions located between the passages, but not to the region facing the central exchange area.

4,407,360

BOREHOLE WATER PUMPING SYSTEM WITH SANDTRAP

Joseph T. Hamrick, Roanoke, Va., assignor to Well-Pack Systems, Inc., Fort Worth, Tex.

Filed Dec. 14, 1981, Ser. No. 330,688

Int. Cl.³ E21B *43/02*

U.S. Cl. 166—68 **3 Claims**

1. A system for pumping water from sub-surface formations to the surface through a cased borehole, comprising:

pump means located in the borehole and having lower inlet means and upper outlet means,

a pipe means coupled to said outlet means of said pump means and extending to the surface through the cased borehole for providing a flow path to the surface,

said pipe means being spaced inward from the wall of said cased borehole defining an annulus between said pipe means and the wall of the cased borehole,

means for operating said pump means,

aperture means formed through said pipe means in the borehole relatively near said pump means,

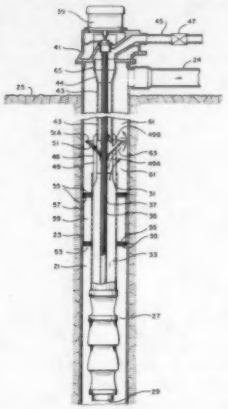
annular packer means located in the borehole between said inlet means of said pump means and said aperture means for engaging the wall of the cased borehole,

sandtrap means comprising structure extending from the interior of said pipe means outward beyond said pipe means into said annulus with its outer periphery spaced inward from the wall of the cased borehole,

said structure dividing said aperture means into lower and upper portions,

the lower portion of said aperture means providing a flow path from said pipe means to said annulus,

said structure causing the water flowing through said lower



portion of said aperture means to flow outward into said annulus and upward between the outer periphery of said structure and the wall of the cased borehole,

the upper portion of said aperture means providing a reentry flow path from said annulus to said pipe means,

water discharge means at the surface coupled to said annulus,

conduit means at the surface coupled to said pipe means, and

valve means coupled to said conduit means adapted to be opened to allow sand trapped by said sandtrap means to flow upward with water through said pipe means and to be discharged through said conduit means.

4,407,361

TOOL TRAP

D. Wayne Van Winkle, P.O. Box 79727, Houston, Tex. 77079

Filed Aug. 27, 1981, Ser. No. 297,033

Int. Cl.³ E21B *33/068*

U.S. Cl. 166—85 **8 Claims**

3. A tool trap for positioning adjacent the upper end of a lubricator to latch with the fishing neck on the end of a wire line tool comprising:

a. housing means for positioning adjacent the upper end of the lubricator, said housing means having a longitudinal bore therethrough;

b. latch means supported in said housing means for latching with the fishing neck on the end of the wire line tool;

c. latch support means supporting said latch means in the bore of said housing means;

d. spring means abutting said latch means and urging said latch means and support means longitudinally of said housing means bore in one direction;

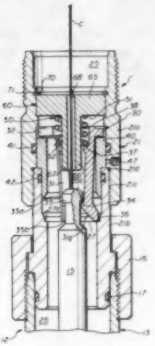
e. seat means projecting inwardly in the bore in said housing means to limit longitudinal movement of said latch means in said one direction and to position said latch means in tool trapping relation;

f. spring support means supporting said spring means;

g. surface means on said latch means engageable by the

fishing neck on the tool to be trapped so that said latch means may be moved longitudinally in the other direction in said housing means bore against the force of said spring means and spread for latching with the fishing neck; and

h. means to move said latch support means and said latch means supported thereby against the force of said spring means to release said latch means from the trapped tool,



said means comprising crank means engaged with said latch support means and extending outwardly of said housing means whereby rotation of said crank means shifts said latch support means and latch means longitudinally of said housing means to move said latch means off said seat means and into the housing bore thereabove to release the latch means from the trapped tool.

4,407,362

FLOW CONTROL APPARATUS FOR WELLS

Howard D. Bechthold, Plano, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 10, 1981, Ser. No. 272,363
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—117.5 **18 Claims**

1. A well device for controlling flow between the interior and the exterior of a well flow conductor, comprising:

a. a mandrel having a main bore therethrough, a belly offset from said main bore and having a receptacle bore therein for receiving a flow control device, said receptacle bore having lateral port means through the wall thereof communicating the receptacle bore with the exterior of the mandrel, said mandrel being connectable in said well flow conductor with its main bore in axial alignment therewith;

b. seal surface means in said receptacle bore providing spaced annular seal surfaces, one on either side of said lateral port means engageable with said flow control device;

c. sleeve valve means in said receptacle bore slidably movable therein between port-closing and port-opening positions for controlling flow through said lateral port means, said sleeve valve means having spaced seal means thereon engaging said spaced annular seal surfaces in said receptacle bore to block flow through said port means when said sleeve valve means is in port-closing position, said sleeve valve means being movable to port-opening position automatically upon installation of said flow control device in said receptacle bore, said flow control device having spaced seal means thereon engageable with said spaced seal surfaces when said flow control device is in position in said receptacle bore; and

d. means on said sleeve valve means coengageable with means on said flow control device to couple said flow control device to said sleeve valve means upon installation thereof and for moving said sleeve valve means to port-closing position responsive to removal of said flow control device from said receptacle bore.

4,407,363

SUBSURFACE WELL APPARATUS

Neil H. Akkerman, Kingwood, Tex., assignor to AVA International, Houston, Tex.

Filed Feb. 17, 1981, Ser. No. 233,629
Int. Cl.³ E21B *33/128, 34/10, 34/14*
U.S. Cl. 166—183 **64 Claims**

42. Subsurface well apparatus, comprising body means disposable within a well bore and having first and second pressure chambers therein, an actuator having a pressure responsive member sealably reciprocable within the first chamber for shifting the actuator between inactive and active positions, a source of fluid contained within the second chamber, a passageway connecting said first and second chambers, valve means shiftable within the body means between a first position closing the passageway and a second position opening the passageway so that pressure fluid from said source is effective to urge said actuator from normally inactive to active position, and means for causing the valve means to shift from its first to its second position, including means urging said valve means toward its second position, means releasably connected to said body for holding said valve means in its first position, and remotely operable means for releasing the connection of said

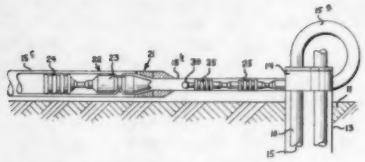
holding means to said body means to permit the valve means to be moved into its second position.

4,407,364

LANDING NIPPLE FOR PUMPDOWN WELL COMPLETION SYSTEM

Russell A. Johnston, Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 27, 1981, Ser. No. 228,996
Int. Cl.³ E21B *23/10*
U.S. Cl. 166—217 **10 Claims**



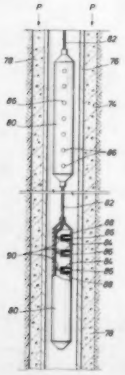
1. A landing nipple for a pumpdown well servicing system parking tool comprising: a first end coupling for connection with a large size flowline; a second opposite end coupling for connection with a small size flowline; a tubular housing secured at opposite ends with said first and second end couplings; and a parking tube secured between said couplings in concentric spaced relation within said housing defining with said housing an annular bypass flow passage within said housing around said parking tube, said parking tube having an internal landing and locking recess profile for releasable locking said parking tool in said parking tube, and said parking tube having longitudinally spaced ports for fluid flow between the bore of said parking tube and said annular flow passage upstream and downstream of a parking tool and large piston unit means locked in said parking tube.

4,407,365

METHOD FOR PREVENTING ANNULAR FLUID FLOW

Claude E. Cooke, Jr., Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Aug. 28, 1981, Ser. No. 297,375
Int. Cl.³ E21B *43/00, 33/14*
U.S. Cl. 166—249 **28 Claims**



1. A method for cementing a well casing in a well which passes through at least one subterranean formation containing pressurized formation fluids, said well casing being inserted in said well so as to define an annulus between said well casing and the wall of said well, said method comprising the steps of:

introducing a cement slurry having a hydrostatic pressure at least equal to the pressure of said pressurized formation fluids into said annulus; and

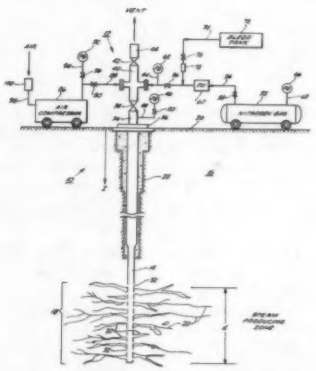
continuously maintaining said hydrostatic pressure of said cement slurry at least equal to the pressure of said pressurized formation fluids until said cement slurry has developed sufficient strength to prevent said pressurized formation fluids from entering said annulus, said hydrostatic pressure being maintained by causing vibration in said well casing.

4,407,366

METHOD FOR GAS CAPPING OF IDLE GEOTHERMAL STEAM WELLS

William C. Lieffers, Fullerton, and Marjorie M. Hatter, Santa Ana, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 7, 1981, Ser. No. 328,195
Int. Cl.³ E21B *33/068, 47/06*
U.S. Cl. 166—250 **22 Claims**



1. A method for capping a geothermal steam well during a period of well non-use, which comprises the steps of:

(a) sealing said geothermal steam well in the vicinity of the wellhead thereof; and

(b) injecting a gas other than steam into said geothermal steam well so as to provide a concentration gradient of said gas and geothermal steam in said well preventing the condensation of substantial amounts of geothermal steam in said geothermal steam well during said period of non-use.

4,407,367

METHOD FOR IN SITU RECOVERY OF HEAVY CRUDE OILS AND TARS BY HYDROCARBON VAPOR INJECTION

Paul H. Kydd, Lawrenceville, N.J., assignor to HRI, Inc., Lawrenceville, N.J.

Continuation of Ser. No. 974,552, Dec. 28, 1978, abandoned.
This application Oct. 14, 1980, Ser. No. 196,771
Int. Cl.³ E21B *43/24, 43/40*
U.S. Cl. 166—267 **1 Claim**

1. A method for recovery of heavy hydrocarbon material such as heavy crude oils and tars from subterranean oil-bearing formation, comprising the steps of:

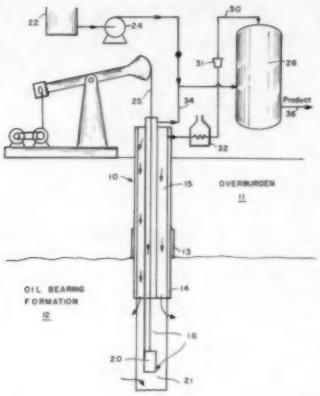
(a) providing a well hole through overburden into the oil bearing formation and installing casing in at least the overburden portion of the hole;

(b) providing a pressurized heated hydrocarbon solvent

vapor and injecting it into the well and into said formation to condense and dissolve and reduce the viscosity of the heavy oil therein and facilitate its flow into the well;

(c) allowing the reduced viscosity oil and condensed solvent liquid mixture to drain into the bottom portion of the well;

(d) pumping the recovered liquids from the well to above ground;



(e) partially distilling the recovered liquid to reclaim at least a portion of the hydrocarbon solvent vapor for reinjection into the well; and

(f) using a portion of the recovered oil as fuel to fire and heat distillation step (e).

4,407,368

POLYURETHANE BALL SEALERS FOR WELL TREATMENT FLUID DIVERSION

Steven R. Erbstoesser, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jul. 3, 1978, Ser. No. 921,413

The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.

Int. Cl.³ E21B *33/138, 43/27*

U.S. Cl. 166—284 **12 Claims**

1. A method of treating a subterranean formation surrounding a cased wellbore wherein the casing has an interval provided with a plurality of perforations, said method comprising:

(a) flowing down said casing a liquid having suspended therein a plurality of ball sealers, said ball sealers being sized to seal said perforations and comprising a solid core and a polyurethane elastomer cover; and

(b) continuing the flow of said liquid until at least a portion of said perforations are sealed by said ball sealers.

11. A ball sealer for plugging perforations in a casing penetrating subterranean formations which comprises a syntactic foam core and a polyurethane, elastomer coating which covers the core.

4,407,369

METHOD AND APPARATUS FOR PLACING A CEMENT THERMAL PACKER

Stanley O. Hutchison, Bakersfield, and Glenn W. Anderson, Oildale, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 29, 1981, Ser. No. 287,469

Int. Cl.³ E21B *33/13*

U.S. Cl. 166—291 **2 Claims**

1. An oil well cementing tool assembly attachable along the in-well portion of a tubing conductor for placing cementing material in the annulus between the outside of said tubing conductor and the inside of a casing element along a cased well at selectable locations between the wellhead and bottom of said well, said assembly including members releasably connected within said tool, said members being removable to establish a smooth interior surface through said tool between tubing above and below said tool, comprising:

(a) a collar member having means at one end for connection to the exterior of a tubing conductor, and means at the other end for connection to an additional tubing conductor;

(b) a sleeve member slidably supported within said collar member, and means for releasably retained said sleeve member within said collar member;

(c) individual port means through said sleeve member and said collar member, said port means being in alignment with each other when said assemby is placed within said well to provide a passageway from within said sleeve member to the exterior of said collar member;

(d) an annular seat within said sleeve member and fixed thereto above said aligned ports in said sleeve member and said collar member;

(e) an annular plug member within said sleeve below said seat and below said aligned ports, said plug member being fixedly attached to said sleeve member;

(f) an upward facing packer means fixed to the lower end of said collar member below said aligned ports in said sleeve member and said collar member;

(g) a cylindrical cross-sectional separation plug means adapted to pass through the interior of said tubing conductor, through said collar member, through said annular seat and to stop at a position below said aligned ports in contact with said annular plug member; and

(h) a cylindrical cross-sectional sealing plug means adapted to pass through the interior of said tubing conductor and to become seated in said annular seat to seal said tubing conductor from said sleeve member below said seat;

(i) said separation plug and sealing plug cooperating with said tubing conductor to contain a cementing material during movement along said tubing conductor toward said collar member;

(j) said separation plug, said sealing plug, said sleeve member and said aligned ports therethrough cooperating to pass said cementing material from within said sleeve member to the exterior of said collar member, said cementing material being placed above said packer member and in the annulus between the exterior of said collar and the interior of said cased well;

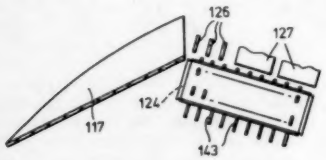
(k) said sealing plug and said seat being adapted to transmit force from above said collar and within said tubing conductor whereby said force causes release of said releasable retaining means to force said sleeve through said collar and into said additional tubing conductor.

4,407,370

SEPARATOR DEVICE

Peter S. Small, and Peter W. Small, both of Forfar, Scotland, assignors to Tonparo Limited, Edinburgh, Scotland

Continuation of Ser. No. 939,113, Sep. 5, 1978, Pat. No. 4,284,145. This application Mar. 5, 1981, Ser. No. 240,986
Claims priority, application United Kingdom, Sep. 10, 1977, 37835/77
Int. Cl.³ A01D *33/02*
U.S. Cl. 171—124 **3 Claims**



1. A separator for separating round root crops from soil and other unwanted material comprising:

a first endless conveyer element having upper and lower runs extending in a longitudinal direction;

a plurality of spaced harvesting members, each comprising at least two elements one of which is a flat plate, secured to said first conveyer element, said harvesting members being arranged on said first conveyer element in a line extending normal to said longitudinal direction, said elements being arranged around said conveyer in rows;

a second endless conveyer element having upper and lower runs, the upper run of said second conveyer element being adjacent to the harvesting members secured to said first conveyer element, the upper run of said second endless conveyer and said harvesting members forming harvesting pockets therebetween, said first and second endless conveyer elements being inclined with respect to the horizontal in a direction transverse to said longitudinal direction;

means for delivering said crop, soil and unwanted material in discrete portions into said harvesting pockets;

means for driving one of said first and second conveyer elements at a higher speed than the other; and

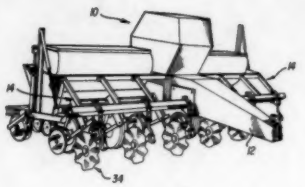
means for driving one row of elements on said harvesting member at a different speed from the speed of another row, round objects comprising part of said crops, soil unwanted material rolling in the direction of incline of said harvesting member out of said harvesting pockets thereby separating said round objects from the rest of said crops, soil and unwanted material.

4,407,371

COULTER ATTACHMENT FOR SEED PLANTING APPARATUS

Gregory D. Hohl, R.R. 1, Box 13, Donnellson, Iowa 52625

Filed Jun. 29, 1981, Ser. No. 278,716
Int. Cl.³ A01C *5/06;* **A01B** *35/28*
U.S. Cl. 172—253 **3 Claims**



1. Apparatus for converting a standard towed seed planter, including a frame and an associated tongue for connection to a source of motive power, into a minimum-till or no-till planter comprising:

(a) a framework including a pair of elongate tool support members;

(b) means for readily and detachably securing the framework to the frame and the tongue of the planter and spaced forwardly thereof so as not to interfere with the functions of the planter, which securing means includes:

i. means for attaching one end of each support member to the tongue; and

ii. at least one rearwardly extending brace including a pair of diverging arms carried by each support member for attachment to the planter frame;

(c) at least one coulter having an upper mounting portion rigidly connected to each support member for engaging the ground surface upon application of downward force to the coulter; and

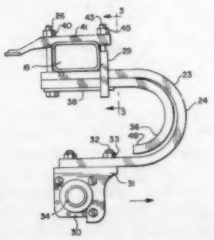
(d) wherein when the framework is secured to the planter frame and tongue, the support members extend laterally from opposed sides of the tongue and are positioned sufficiently forward of the planter so as to maximize the downward force applied to the coulter resulting from torque developed by the weight of the planter about a fulcrum defined at the point of connection between the tongue and the source of motive power.

4,407,372

DISK HARROW WITH CUSHION GANG

Henry Rozeboom, Bolingbrook, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Sep. 17, 1981, Ser. No. 303,290
Int. Cl.³ A01B *21/08, 35/28, 61/04*
U.S. Cl. 172—572 **4 Claims**



1. A disk harrow comprising a frame adapted to be towed and having a generally laterally extending rigid supporting

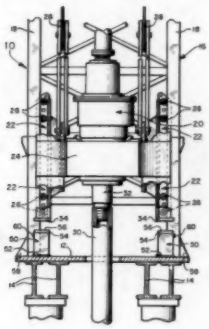
beam, a shaft located below said beam and a plurality of spaced disks mounted on such shaft for rotation therewith, at least a pair spaced bearing standards for resiliently mounting said shaft to said beam, each standard comprising a first generally C-shaped spring with the closed portion of the spring facing the direction of travel, said first spring having an upper portion connected to said beam and a substantially horizontal lower portion rotatably supporting said shaft for low disk impact modes, and a second C-shaped spring nested within the first C-shaped spring having its upper end connected to the first spring, a medial portion spaced therefrom generally along the C-periphery, and a free lower end adjacent said lower horizontal portion of said first spring, generally rearward loads on said disks causing a gradual increase in the spring rate acting on said disks with increasing peripheral contact between said first and second springs and vertical loads on said disks causing an abrupt increase in the spring rate upon said free end of said second spring contacting the horizontal portion of said first spring.

4,407,373

COLLAPSIBLE PEDESTAL FOR DRILLING APPARATUS

Clyde A. Willis, and Jerry K. Lingafelter, both of Wichita Falls, Tex., assignors to Walker-Neer Mfg. Co., Inc., Wichita Falls, Tex.

Filed Jun. 1, 1981, Ser. No. 269,278
Int. Cl.³ B23Q *5/00*
U.S. Cl. 173—141 **7 Claims**



1. In a drilling apparatus comprising a platform, means for supporting a string of down-hole tubulars, means for guiding the vertical movement of the string support means, and means for raising and lowering the string support means in the guide means, the improvement comprising:

at least two support surfaces, each positioned laterally with respect to the string and defined by one of the string support means and the platform; and

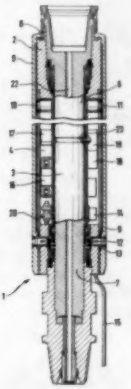
at least two collapsible pedestals mounted on the other of the string support means and the platform, each pedestal positioned in alignment with a respective support surface such that the support surfaces come into contact with the pedestals when the string support means is lowered toward the platform, said pedestals having a collapse strength chosen such that the pedestals rigidly support the string support means at a first level above the platform when static, and, in the event the string support means and the string fall from at least a predetermined height, collapse in a controlled, progressive manner, substantially without damage to the guide means, thereby protecting both the platform and the string from excessive loads associated with abrupt deceleration of the string support means and at least substantially reducing the incidence of string breakage due to such abrupt deceleration of the string support means.

4,407,374

DEVICE FOR CONTROLLING THE ORIENTATION OF BORE HOLES

Heinz Wallussek, Herdecke; Martin Wiebe, Hattingen, and Thomas Röder, Herne, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,591
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046122
Int. Cl.³ E21B *7/08*
U.S. Cl. 175—24 **18 Claims**



1. Device for controlling the orientation of bore holes, particularly in underground coal mining applications, comprising a drill guide rod adapted to be included in a drill string rearwardly of the drill bit and including an outer elongated element and an inner elongated element coaxial with and turnable in said outer element; inclinometer means on at least one of said elements and operative for generating signals when inclination of said rod indicates deviation from a predetermined bore hole path; pivotably adjustable correcting means including a plurality of gib-shaped correcting members pivotally mounted on said outer element; a plurality of cylinder-and-piston units arranged for engaging said members and pivoting them outwardly away from said outer element to a selectable extent; a generator to be driven by said inner element; and magnetic valves supplied from said generator and controlled by signals received from said inclinometer means to thereby control the operation of said cylinder-and-piston units so as to pivot said gib-shaped correcting members.

4,407,375

PRESSURE COMPENSATOR FOR ROTARY EARTH BORING TOOL

Osamu Nakamura, Tokyo, Japan, assignor to Tsukamoto Seiki Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1981, Ser. No. 293,263
Claims priority, application Japan, May 29, 1981, 56-78490[U]
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—228 **3 Claims**

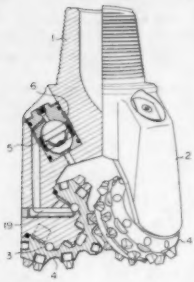
1. A pressure compensator for being removably installed in the bit body of a rotary earth boring tool, said compensator comprising:

an upper capsule half having a first hemispherical cavity and a step in the edge thereof around the periphery thereof;

a lower capsule half having a second hemispherical cavity

and a step in the edge thereof around the periphery thereof;

said first and second capsule halves having the peripheries abutting each other to form a substantial spherical space with a circumferential groove defined by said steps around the joint between said capsule halves; and



a diaphragm member of distendable material and having a periphery and a reinforcing ring of hard material embedded in the distendable material and extending around said periphery, said ring embedded in said distendable material being positioned in said groove with the edges facing the respective capsule halves being snugly engaged with the steps, and said diaphragm extending across said spherical space and dividing said space into two portions.

4,407,376

UNDER-REAMING PILE BORE EXCAVATOR

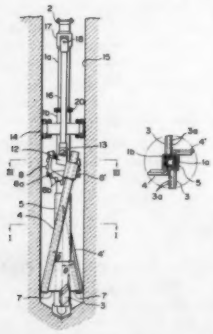
Hachiro Inoue, 13-10, Kokubun 4-chome, Ichikawa-shi, Chiba-ken, Japan

Filed Jun. 26, 1981, Ser. No. 277,817

Claims priority, application Japan, Mar. 17, 1981, 56-037161[U]

Int. Cl.³ E21B *7/28, 10/32*

U.S. Cl. 175—267 **4 Claims**



1. An under-reaming pile bore excavator which comprises:

(a) an inner pipe to which an excavating torque is applied;

(b) an outer pipe telescopically connected to said inner pipe, said outer pipe being rotated together with said inner pipe in either direction;

(c) a plurality of main drill bits fixed to the bottom of said outer pipe at an appropriate bit angle to excavate a straight pile bore;

(d) a plurality of guide rails fixed to said outer pipe at an inclined angle with respect to the axis of said outer pipe, said plurality of guide rails being disposed so as to obliquely cross the axis of said outer pipe;

(e) a plurality of slidable wing bits slidably mounted on said guide rails at an appropriate bit angle to excavate an under-reamed pile bore when moved downward and outward along said guide rails, said slidable wing bits being rotated in a direction opposite to that of said main drill bits; and

(f) a plurality of connecting rods for connecting said slidable wing bits to said inner pipe so that said slidable wing bits can extend in the radial direction along said guide rails,

whereby a straight pile bore is first excavated by said main drill bits with said slidable wing bits fixed in their uppermost position and then the under-reamed pile bore is next excavated by moving said slidable wing bits downward and extending them outward along said guide rails so that a greater ratio of the diameters of the under-reamed pile bore and the straight pile bore can be obtained.

4,407,377

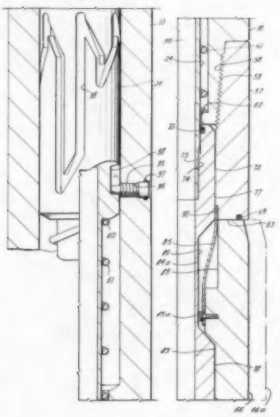
SURFACE CONTROLLED BLADE STABILIZER

Larry R. Russell, 6025 Edgemor, Suite C, Houston, Tex. 77081

Filed Apr. 16, 1982, Ser. No. 368,996

Int. Cl.³ E21B *7/00, 17/00, 34/10*

U.S. Cl. 175—325 **12 Claims**



1. Drill string stabilizer apparatus, comprising tubular body means comprising an upper tubular body and a lower tubular body connected end-to-end, said tubular body means having upper and lower connection means for connecting said tubular body means into a drill string, first sleeve means lining said upper tubular body, second sleeve means disposed slidably annularly inward from said first sleeve means forming a pressure accumulator therebetween, said second sleeve means being biased upwardly by pressure within said accumulator and being adapted to be slidably moved downwardly by pressure within said upper tubular body sufficient to overcome said accumulator pressure, valve means adapted to be open when said second sleeve means is in its upward position and to be closed by downward movement of said second sleeve means, said lower tubular body having plural circularly spaced vertical slots having stabilizer blades slidably disposed therethrough and movable radially between expanded and retracted positions therein, actuator sleeve means movable downwardly to expand said stabilizer blades and movable upwardly to permit inward movement of said stabilizer blades, spring means for moving said stabilizer blades inwardly when said actuator sleeve means is moved upwardly, whereby said stabilizer blades are expanded by increase of pressure within said upper

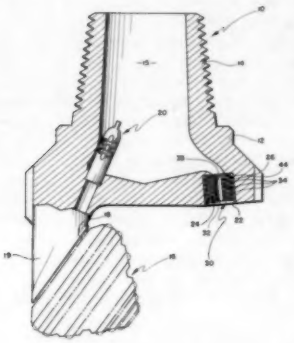
tubular body and are retracted upon decrease of pressure within said upper tubular body.

4,407,378

NOZZLE RETENTION METHOD FOR ROCK BITS

Robert D. Thomas, Tonkawa, Okla., assignor to Smith International, Inc.

Filed Mar. 11, 1981, Ser. No. 242,811
Int. Cl.³ E21B *10/18*
U.S. Cl. 175—340 **3 Claims**



1. A fluid nozzle retention device for a rock bit comprising:

a rock bit body having a first pin end and a second cutter end, said bit body forming a fluid chamber in said pin end of said bit body,

a circular nozzle retention cavity formed in said bit body, said cavity having substantially parallel walls, said cavity being in fluid communication with said chamber, and

a circular nozzle body, said body forming a fluid orifice substantially axially through said body communicating with said chamber, said body further forming one or more substantially radially extending fins integral with said body, each of said fins being relatively flexible, a circumference of each fin being slightly larger in diameter than the diameter of said cavity formed in said rock bit body, each fin extends beyond said nozzle body from forty to sixty thousandths of an inch where the diameter of the nozzle body is about one and one-quarter of an inch, insertion of said nozzle body into said cavity deflects each of said one or more flexible fins in an axial direction whereby an edge surface of each fin grips said wall of said nozzle retention cavity retaining said nozzle in said cavity.

4,407,379

HIGH ACCURACY FILLING MACHINES

Timothy R. Pryor, Tecumseh, and Omer L. Hageniers, Windsor, both of Canada, assignors to Diffracto Ltd., Windsor, Canada

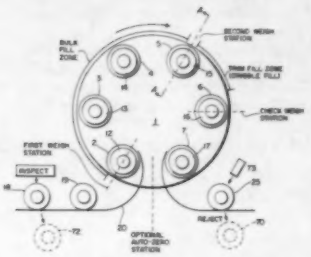
Filed Jun. 12, 1981, Ser. No. 273,115
Int. Cl.³ G01G *13/00, 3/14*
U.S. Cl. 177—52 **34 Claims**

1. In a method of weighing and filling a plurality of containers, the improvement comprising:

providing a plurality of moving weigh members each comprising a moveable member moveable in proportion to the weight of material in a container weighed by the weigh member and a fixed reference member fixed with respect to the weigh member so as to move therewith,

automatically and electro-optically measuring the position of the moveable member of each weigh member relative to the fixed reference member thereof,

determining from the relative position of said moveable member with respect to said fixed reference member the weight of material in the container and,



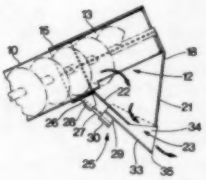
from said determined weight, terminating, adding to or subtracting from the filling of said container or subsequent fillings of similar containers.

4,407,380

WEIGHING DEVICE FOR FLUENT MATERIAL

David I. M. Elder, Little Barn, Manor La., Great Chesterford, Saffron Waldon, England

Filed Jun. 10, 1981, Ser. No. 272,394
Claims priority, application United Kingdom, Jun. 17, 1980, 8019809
Int. Cl.³ G01G *11/04*
U.S. Cl. 177—145 **8 Claims**



1. A device for weighing a flow of fluent material, comprising a sensor member having a surface inclined to the horizontal; feed means for feeding said flow of material to said surface; support means for supporting the sensor member and including a cantilever beam supported at one end and lying in a plane substantially parallel to the plane of the sensor member; sensing means including strain gauge means arranged to sense the bending moment in the beam; and comparison means arranged to receive signals from the sensing means corresponding to said bending moment, compare the signals and provide an output signal corresponding to the weight of material engaging the sensor member, the sensor member being arranged so that the flow of material from the feed means passes over said surface after a fall under gravity from the feed means is interrupted by said surface, and the material is discharged from the lower end of said surface, and the arrangement of the beam is such that the bending moment sensed corresponds to the reaction developed in the sensor member in a direction at right angles to the sensor member surface.

4,407,381
UNDERCARRIAGE FOR ADVERSE TERRAIN VEHICLES

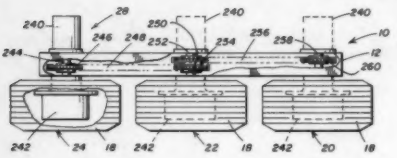
Norman D. Oswald, Duncanville, and Harry S. Mankey, Dallas, both of Tex., assignors to Standard Manufacturing Company, Inc., Dallas, Tex.

Continuation of Ser. No. 115,942, Jan. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 11,857, Feb. 13, 1979, Pat. No. 4,210,218, which is a continuation of Ser. No. 799,328, May 23, 1977, abandoned. This application May 7, 1982, Ser. No. 375,973

The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.

Int. Cl.³ B62D *21/00*

U.S. Cl. 180—6.48 **7 Claims**



1. An undercarriage assembly for supporting and propelling a mechanism, comprising:

an elongate hollow load-bearing frame adapted for connection to the mechanism;

at least three axle members each having a wheel receiving member at one end thereof;

at least three wheel members each mounted on and secured to a wheel receiving end of an axle member outside said frame;

means rotatably supporting the axle members at longitudinally spaced points along the frame with each of the axle members extending through the frame and being rotatably supported in opposite sides of said frame;

the middle wheel member extending below a plane lying tangent to the bottoms of the endmost wheel members to facilitate skid steering of the mechanism;

transmission means positioned within the frame for drivingly interconnecting the middle axle member with at least one of the endmost axle members;

drive means operably connected to the transmission means for actuation thereof whereby the drive means and the transmission means cause concurrent rotation of the interconnected axle members; and

said transmission means further including a planetary gearset drivingly interconnecting each axle and the wheel mounted thereon.

4,407,382
WHEEL HEAD FOR DRIVING WHEELS OF VEHICLES

Peter Dziuba, Ueberlingen, and Manfred Goeft, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 31, 1981, Ser. No. 249,715

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013431

Int. Cl.³ B62D *55/00*

U.S. Cl. 180—10 **6 Claims**

1. A wheel head for a driven wheel of a vehicle comprising:

a hollow nonrotatable axle having a free end;

a wheel bearing mounted on said free end of said axle;

a wheel hub journaled on said wheel bearng and having an annular housing member extending axially therefrom and projecting outwardly beyond said end, said housing member enclosing a space opening at an extremity of said housing member remote from said axle, said hub being adapted to receive a vehicle wheel for supporting same substantially in the plane of said wheel bearing;

a cover detachably affixed to said housing member at said extremity for enclosing said space and affording access thereto upon removal of said cover, said cover being formed unitarily and in one piece with at least one journal bolt;

a drive shaft extending through said axle and terminating in said space;

speed-reducing planetary gearing in said space connecting said drive shaft to said hub for rotating same, said planetary gearing including:

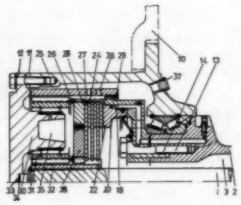
a sun gear on said shaft,

at least one planetary gear meshing with said sun gear and journaled on said bolt, and

a ring gear meshing with said planet gear, and said ring gear being dimensioned to be withdrawn from said space through said extremity upon removal of said cover;

a wheel bearing cap detachably affixed to said end of said axle in said space axially outwardly of said wheel bearing and formed with an annular collar externally engaging said ring gear and angularly coupling same with said axle, said cap being dimensioned to enable withdrawl of said wheel bearing cap from said space upon the detachment thereof said axle; and

a brake operated by a pressure medium disposed between



said wheel bearing cap and said cover and of a diameter less than that of said ring gear for enabling withdrawal of said brake from said space through said extremity upon removal of said cover, said brake comprising:

an annular piston mounted on said wheel bearing cap and disposed within said collar, said piston being axially displaceable upon pressurization of a chamber defined between said piston and said wheel bearing cap and supplied with fluid through a passage in said wheel bearing cap,

a plurality of brake elements angularly coupled with said sun gear,

a plurality of brake elements angularly coupled with said ring gear being interleaved within said ring gear, said piston having only external sealing surfaces receiving respective sealing rings, the piston further having a face extended inwardly from said collar for bearing against said elements,

spring means braced between said piston and said wheel bearing cap for biasing said piston against the force developed by fluid pressure, and

a support disc disposed within said ring gear between said elements and said cover,

said support disc comprises an outer portion angularly connected with said ring gear and an inner portion constituting a piece separate from said outer portion and angularly connected to said sun gear, said portions being axially fixed to the respective gear.

4,407,383
MOTOR VEHICLE

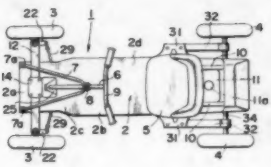
Akito Enokimoto, Asaka; Toshio Tsuchiya, Kawagoe; Tatsuo Masuda, Niiza, and Suwaji Takano, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 83,627, Oct. 11, 1979, abandoned. This application Oct. 20, 1981, Ser. No. 313,361

Claims priority, application Japan, Oct. 13, 1978, 53-125947

Int. Cl.³ B60R *5/04*

U.S. Cl. 180—54 E **5 Claims**



1. A single-seated motor vehicle having two front wheels and at least one rear wheel, said at least one rear wheel being driven by a power unit, wherein the driver can comfortably place at least either foot on a ground surface while in a seated position, comprising:

a saddle seat for a driver of said vehicle, said seat being spaced upwardly from the level of the uppermost portions of said wheels and disposed substantially at a longitudinal center of a frame of said vehicle;

a steering shaft disposed substantially at a widthwise center of said vehicle frame;

said frame including a floor which is interposed between said steering shaft and said seat and which extends substantially horizontally at a level substantially lower than said level of the uppermost portions of said wheels;

said floor having a substantially constant width along the longitudinal direction thereof which is substantially the same as the width of said seat, and being substantially open at both sides thereof;

said front wheels being arranged in a manner protruding transversely from respectively opposite sides of said floor;

said floor having said substantially constant width defining an open space extending rearwardly of said protruding front wheels and along each side of said floor so as to permit a seated drive of said vehicle to comfortably place each foot on a ground surface at the respective sides of said floor; and

a handlebar fixed to said steering shaft, said handlebar having a length longer than the width of said floor.

4,407,384
POWER ASSISTED STEERING ARRANGEMENTS AND DEVICES FOR USE THEREIN

David Auty, Leeds, England, assignor to Autosteer Developments Limited, Leeds, England

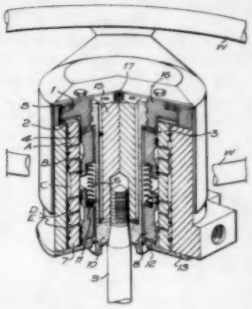
Filed Jun. 16, 1980, Ser. No. 159,905

Claims priority, application United Kingdom, Jun. 30, 1979, 7922800; Feb. 6, 1980, 8003988

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—146 **3 Claims**

1. In an air operated, power assisted steering mechanism including a steering wheel, a steering shaft and a control valve adapted so that the operation of the control valve is derived from rotation of the steering wheel and in particular the valve is of a type having a rotatable drive member, the rotation of which in opposite directions effects movement of the drive member and control component of the valve is opposite relative axial movement for the appropriate directing of the pressure air to an air operated, power assisting steering ram of the mechanism, wherein the actuation of the valve is achieved by a spiral scroll shaft and nut arrangement whereby the rotary action of the steering wheel is converted into relative linear motion of ported sleeve means with respect to valve spool means of the valve, thus closing exhaust ports and opening inlet ports of the valve which are connectable to the power



ram to pressurize same with air thereby to provide air operated power assisted steering, the improvement that the control valve is in a casing forming the hub of the steering wheel and the steering wheel is connected to said drive member and so effects axial movement therewith relative to the steering shaft.

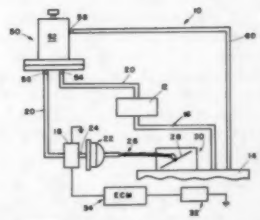
4,407,385
CRUISE CONTROL MODULATOR

Carl W. Hilton, and Harold L. Bullard, both of Muskegon, Mich., assignors to Return on Investment Corporation, Muskegon, Mich.

Filed Nov. 4, 1980, Ser. No. 204,066

Int. Cl.³ B60K *31/00*; **F02D** *31/00*

U.S. Cl. 180—175 **8 Claims**



1. In a vehicle cruise control system of the type including a vacuum actuated servo connected to an engine throttle valve, a source of vacuum and a control means connecting the source of vacuum to the servo for controlling throttle position to maintain a preset vehicle speed, the improvement comprising adjustable modulator means operatively connected to said control means and said servo for automatically limiting opening movement of the throttle by modulating communication of vacuum through said control means to said servo to override said control means so that vehicle speed will drop below the preset vehicle speed which the control means seeks to maintain upon the vehicle encountering an incline to increase fuel efficiency and soften throttle position changes, said modulator means comprising valve means operatively connected to said source of vacuum and said control means for shutting off communication of said source of vacuum with said control means, and wherein said valve means comprises:

a valve housing defining a vacuum inlet, a vacuum outlet and a diaphragm chamber;

a diaphragm positioned within said chamber;

a valve element secured to said diaphragm and closing said

vacuum inlet when in a first position and opening said vacuum inlet when in a second position; and

resilient means engaging said diaphragm and biasing said valve element towards its first position.

4,407,386

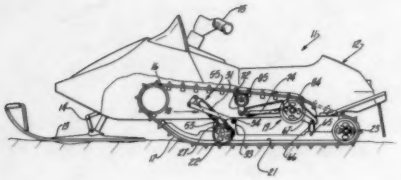
SNOWMOBILE SUSPENSION UNIT

Toshihiro Yasui, and Wayne L. Warnke, both of Coon Rapids, Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 31, 1981, Ser. No. 336,417

Int. Cl.³ B62M *27/02*

U.S. Cl. 180—193 **5 Claims**



1. In a snowmobile or the like having a body and a ground engaging track, an improved suspension for the forward portion of said track comprising guide means for engaging and locating a forward portion of said track, lever means having a first pivotal connection about a first pivot axis to said guide means, first link means pivotally supported at one end thereof to said body, means pivotally connecting the other end of said first link means to said guide means about a second pivot axis spaced from said first pivot axis, second link means having a first end pivotally connected to said first link means, means pivotally connecting the other end of said second link means to said lever means at a point spaced from said first and second pivot axes for pivotal movement of said lever means upon movement of said guide means relative to said body, suspension means having first and second relatively movable portions adapted to resiliently resist such relative movement, means operatively connecting one of said portions to said body, and means pivotally connecting the other of said portions to said lever means at a point spaced from said first pivot axis for loading of said suspension means upon relative movement of said guide means to the body.

4,407,387

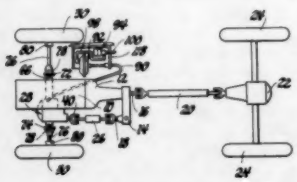
CONTROL SYSTEM FOR SPLIT AXLE DRIVE MECHANISM

Brook A. Lindbert, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 29, 1981, Ser. No. 268,580

Int. Cl.³ B60K *17/34, 23/08*

U.S. Cl. 180—247 **8 Claims**



1. A control system for automatically operating the clutch in a single clutch split axle drive mechanism responsive to an operational mode of a transfer case, with which the split axle drive mechanism is used in a part-time four-wheel drive vehicle powered by an internal combustion engine, comprising:

a vacuum motor mechanically connected to the clutch so that the clutch is biased toward disengagement when the vacuum motor is vented and biased toward engagement when the vacuum motor is evacuated,

conduit means connecting the vacuum motor to a vacuum source provided by the internal combustion engine,

said conduit means including a two-way valve which has a first operative position where the vacuum motor is connected to a vent and a second operative position where the vacuum motor is connected to the vacuum source for evacuating the vacuum motor,

means operatively connected to the transfer case positioning the two-way valve in the second operative position when the transfer case is in a four-wheel drive mode whereby the clutch is automatically engaged when four-wheel drive is selected, and

said two-way valve being mechanically positioned in the fist operative position when the transfer case is in the two-wheel drive mode whereby the control system does not require any power for operation in the two-wheel drive mode.

4,407,388

COLLISION PREVENTION SYSTEM

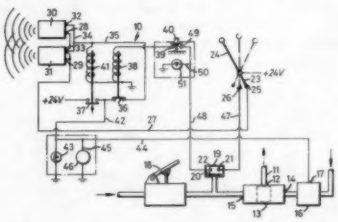
James Steel, Newcastle Upon Tyne, England, assignor to Ogden Electronics, Ltd., Yorkshire, England

Filed Mar. 11, 1981, Ser. No. 242,523

Claims priority, application United Kingdom, Mar. 19, 1980, 8009244; Sep. 25, 1980, 8030904

Int. Cl.³ B60T *7/12*

U.S. Cl. 180—271 **2 Claims**



2. Apparatus for automatically controlling the braking system of a vehicle which vehicle includes a manually actuated foot brake pedal and a gear shift lever, said apparatus comprising:

hazard detection means for detecting a hazard in the path of the vehicle while the gear shift lever is placed in a reverse gear position and for producing a control output in response to such detection;

automatic brake actuation means connected to respond to said control output for automatically actuating said braking system and maintaining said braking system in the actuated mode to thus retard motion of the vehicle; and

manual reset control means for deactuating said automatic brake actuation means including

a manually actuatable cancel means,

a gear shift lever actuated means, and

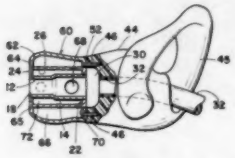
control means operatively associated therewith and with said brake pedal for effectively deactivating and resetting said automatic brake actuation means only when (a) the gear shift lever has been manually moved out of a reverse gear position, (b) the brake pedal has been actuated, and (c) the cancel means has been actuated.

4,407,389

VENTED ACOUSTIC EAR MOLD FOR HEARING AIDS

Rubein V. Johnson, 2432 Court St., Muskogee, Okla. 74401

Filed Jan. 19, 1981, Ser. No. 226,030
Int. Cl.³ A61B 7/02
U.S. Cl. 181—135 9 Claims



1. A hearing aid ear mold insertable into the auditory canal of the user for the passage of sound wave energy from a hearing aid to the tympanic membrane of the ear, comprising:

(a) an inner central thin-walled metal tube forming a longitudinal conduit connected at its outer end by tubular means to a hearing aid;

(b) a first outer thin-walled metal tube coaxial with said inner central tube, and forming a first annular space closed by annular end walls sealing the annular space between said inner and said first outer metal tubes;

(c) at least one opening in the wall of said inner tube joining said first annular space and the space inside said tube; and

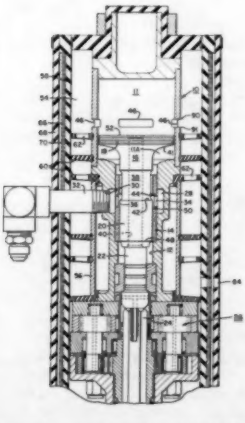
(d) a second outer thin-walled metal tube coaxial with said inner central tube and said first outer metal tube, forming a second annular space, closed off by outer and inner annular walls in the plane of said annular end walls closing said first annular space.

4,407,390

PNEUMATIC MOTOR

Louis H. Le Blanc, Jr., Claremont, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 77,246, Sep. 19, 1979, Pat. No. 4,308,925.
This application Aug. 7, 1981, Ser. No. 291,025
Int. Cl.³ F01N 1/08
U.S. Cl. 181—230 3 Claims



1. In a pneumatic motor having cylinder means, a piston reciprocable within said cylinder means, ports in the wall of said cylinder through which exhaust gas passes, and a muffler surrounding said cylinder for receiving said exhaust gas, the improvement in said muffler comprising:

an annular wall of resilient material surrounding said cylinder means;

annular spacers separating said wall from said cylinder means;

openings in said spacers through which exhaust gas can pass, said opening in at least some spacers being displaced about the cylinder axis with respect to the opening in a next adjacent spacer, whereby exhaust air will after passing in a generally longitudinal direction with respect to said cylinder axis flow generally circumferentially to the next said opening, and

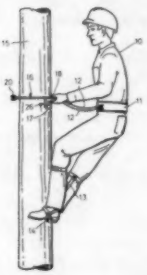
an opening in said annular wall through which exhaust gas passes to the atmosphere after passing through the openings in said spacers.

4,407,391

POLE CLIMBER'S SAFETY DEVICE

Peter R. Greenway, 5105 Mount Nemo Rd., R.R. #2, Milton, Ontario, Canada L9T 2X6; Andrew C. Sulowski, 6 Sweet Pea Path, Weston, Ontario, Canada M6P 3S3, and Henry C. George, 57 Ambleside Ave., Toronto, Ontario, Canada M8Z 2H8

Filed Apr. 14, 1982, Ser. No. 368,301
Int. Cl.³ A62B 35/00
U.S. Cl. 182—9 11 Claims



1. A pole climber's safety device comprising a closed yoke for encompassing a pole, the yoke consisting of a pair of arcuate half yokes providing upper and lower surfaces, the half yokes being hingedly interconnected with respect to a vertical axis at one pair of adjacent ends; releasable fastening means interconnecting the other pair of adjacent ends of said half yokes; attachment means for attaching safety belt connectors to the yoke; a pair of handle portions extending outwardly from the half yokes on either side of said attachment means; a plurality of blades pivotally mounted on the lower surfaces of said half yokes for pivotal movement about respective horizontal pivotal axes, the blades projecting inwardly from the half yokes for biting or gripping engagement with the pole; means biasing the blades about their pivotal axes to a pole engaging position; and manually operable means for retracting the blades in one direction from the pole engaging position about their pivotal axes for permitting movement of the device down the pole.

4,407,392

SAFETY SCAFFOLD FOR METAL MELTING FURNACES

William B. Lazzari, LaGrange, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,221
Int. Cl.³ E04G 3/14
U.S. Cl. 182—128 4 Claims

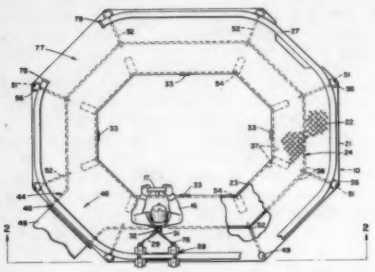
1. A scaffold for supporting a workman with respect to a top opening in a metal melting furnace, which comprises:

platform means of a size adapted to fit over and rest on the walls surrounding a furnace opening, said platform means

having a central opening conforming to the opening in the furnace, and further including ducts extending around said platform opening having first vent openings facing the platform opening, and a second opening facing away from the platform opening;

means secured about said second opening for exhausting fumes from said duct means;

a plurality of spaced posts extending upwardly from the outer periphery of said platform means;



a track secured to the posts and running from a first to a last of said posts to leave an entry between said first and last posts;

a trolley mounted on and movable along the track; and

lanyard means secured to the trolley and adapted to be attached to a workman on the platform means, said lanyard means being of such length as to restrict movement of the workman to positions adjacent to the platform opening.

4,407,393

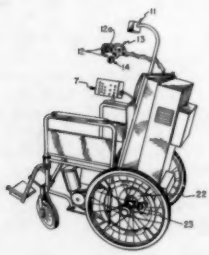
PROPORTIONAL BRAKE FOR POWERED WHEELCHAIRS

Myron Youdin, 200 E. 33rd St., New York, N.Y. 10016; Mario W. Clagnaz, Jr., 18 Helen Ct., Floral Park, N.Y. 11001, and Henry Louie, 2669 E. 23rd St., Brooklyn, N.Y. 11235

Filed May 22, 1981, Ser. No. 266,623

Int. Cl.[3] B60T 7/02

U.S. Cl. 188—2 F 11 Claims



1. A proportional braking system for a powered wheelchair comprising:

one or more wheelchair brakes;

means controllable by the operator of the chair for selecting and maintaining an amount of braking force to be applied by said brakes;

control means responsive to said selecting means for generating a braking signal;

brake activation means responsive to said signal for proportionately activating said brakes and maintaining the activation of said brakes with the amount of braking force selected by the operator.

4,407,394

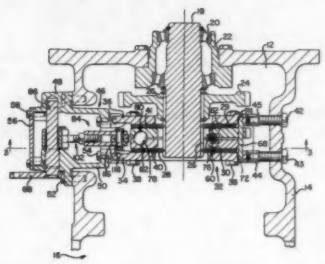
DYNAMIC BRAKE MOUNT ASSEMBLY

Aldo Allori, Brookfield; John A. Wilger, Chicago, and Julian D. Voss, Naperville, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Jun. 10, 1981, Ser. No. 272,147

Int. Cl.[3] F16D 55/08

U.S. Cl. 188—71.4 8 Claims



1. A dynamic brake mount assembly comprising:

a fluid filled chamber defined by a chamber casing;

a rotatable shaft disposed within said chamber;

coaxially spaced brake discs removably attached to and rotatable with said shaft;

a disassembleable brake housing extended about said shaft and frictionally engageable with said brake discs for retarding the shaft rotation;

at least a pair of cooperating pressure plates located within said brake housing and between said discs;

said plates being axially displaceable upon rotational movement thereof in opposite directions;

an actuator mechanism means for rotating said plates in opposite directions; and

cam means disposed intermediate the plates forcing the plates apart and into frictional interengagement with said discs;

said brake housing being stationary located within said chamber space by an actuator mechanism housing and detachable support means;

said actuator mechanism housing partially encompasing said actuator mechanism means being mounted on said casing and rigidly attached to one side of said brake housing;

said detachable support means interconnecting said casing with another side of said brake housing for immobilizing support thereof within said chamber space.

4,407,395

MECHANICAL SHOCK AND SWAY ARRESTOR

Leonard S. Suozzo, 366 Maple Hill Dr., Hackensack, N.J. 07601

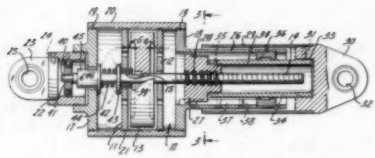
Filed Sep. 25, 1981, Ser. No. 305,514

Int. Cl.[3] B60T 7/12

U.S. Cl. 188—134 8 Claims

1. A mechanical shock and sway arrestor adapted to be interposed between piping and a stationary support for said piping wherein said mechanical shock and sway arrestor comprises a housing having a tubular wall having first and second end walls which are externally threaded for engaging internal threads of said tubular wall and wherein said first end wall has a first central opening for threadably receiving a tubular extension which in turn has a central opening for receiving an ear which is secured to said tubular extension by screw means which ear connects one end of said arrestor to said fixed support; said second end wall having a second tubular extension

formed integrally therewith and extending longitudinally thereof; an outer sleeve disposed about said second tubular extension and extending coaxial therewith and secured to a second ear which second ear connects one end of said arrestor to said piping; said second ear having internal threads for engaging threads on an inner sleeve which extends longitudinally of said second tubular extension and said outer sleeve and coaxial therewith; a ball nut fixedly secured against rotation and disposed within said second tubular extension and connected to one end of said inner sleeve; first and second parallel and spaced apart clutch plates disposed in said housing having external threads formed on their periphery for engaging internal threads formed in said tubular wall and having central openings formed there through; a flywheel disposed in said housing and between said clutch plates and having a central opening formed there through coaxial with said central openings formed in said clutch plates; a screw member disposed in said housing and extending longitudinally and coaxial with said inner and outer sleeves and said second tubular extension and extending through said central openings formed through said clutch plates and said flywheel and through a threaded open-



ing formed through said ball nut; a first collar disposed about said screw member in said housing and disposed between said first end wall and said first clutch plate and coating with a sleeve disposed in said central opening formed in said first clutch plate; a second collar disposed about said screw member in spaced apart parallel relationship with said first collar and disposed in said housing and disposed between said first collar and said first end wall said second collar coacting with an adjustable sleeve which is also disposed about said screw member; a spring disposed in said housing about said screw member and positioned between said first and said second collars; and, a ball bearing disposed in said central opening of said threaded tubular extension for rotatably supporting said screw member whereby in response to longitudinally axial movement of said piping causing said inner and outer sleeves and said screw member to also move axially, in either direction, one of said clutch plates will engage said flywheel stopping further axial movement and forming a rigid strut of the mechanical shock and sway arrestor and effectively shortening its length which will be returned to its normal length by said spring when the axial force is removed.

4,407,396

HYDRAULIC SHOCK ABSORBER HAVING PISTON-MOUNTED VALVE BIASED BY GASEOUS PRESSURE

Jacques M. M. Sirven, 34 Rue de l'Orangerie, 78000 Versailles, France

Continuation of Ser. No. 3,688, Jan. 15, 1979, abandoned. This application Jul. 7, 1981, Ser. No. 281,140

Claims priority, application France, Jan. 25, 1978, 78 02054

Int. Cl.³ F16F 9/50

U.S. Cl. 188—282 **28 Claims**

1. A damping device for damping the relative movement of two bodies comprising:

a cylinder for hydraulic fluid,

a main piston movable axially in the cylinder and dividing the cylinder into a first chamber and a second chamber,

a rigid element secured to said piston,

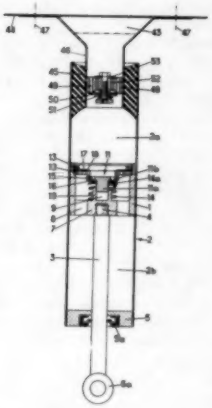
a rod connected to the piston and extending through the second chamber,

a fluid storage space which is in communication with the first chamber and is not in direct communication with the second chamber,

a first restrictive passage means opening from said first chamber to said storage space permitting fluid to flow from said first chamber to said storage space, said restrictive passage means limiting the flow of fluid therethrough to cause the pressure in the first chamber to increase in response to piston movement toward the first chamber,

a regulating valve on said main piston, said regulating valve being movable during a rapid compression movement of said piston from a closed position to an open position at which said first chamber is in communication with said second chamber, said regulating valve having surfaces exposed to pressures of the fluid in the first and second chambers,

a return spring for biasing the regulating valve toward its closed position, said return spring bearing against said rigid element secured to said piston,



a substantially fluid tight reference chamber on said main pist ⁻ containing a substantially constant pressure gas for biasing the regulating valve toward its closed position, said regulating valve having a first surface portion which closes said reference chamber, a second surface portion of said valve being exposed to the pressure of said first chamber, and said first surface portion having an area no greater than said second surface portion,

said regulating valve and said reference chamber acting as pressure control means which, within a range of compression rates which lie below a given compression rate (V_1), is operable to provide damping forces which increase progressively when the compression rate increases, and

said pressure control means, within a range of compression rates which lie above said given compression rate (V_1) and below a limit compression rate (V_0) being operable to provide damping forces which decrease progressively when the compression rate increases.

4,407,397
SHOCK ABSORBER WITH PRESSURE-RELIEF MECHANISM

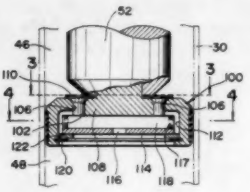
Naoto Fukushima, Fujisawa; Kunihiko Hidaka, Kamakura, and Kazuroh Iwata, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1981, Ser. No. 306,181

Claims priority, application Japan, Oct. 16, 1980, 55-147793[U]; Oct. 29, 1980, 55-151737

Int. Cl.³ F16F *9/34*

U.S. Cl. 188—282 **7 Claims**



1. A hydraulic shock absorber comprising:

a hollow cylinder defining therein a fluid chamber filled with a working fluid;

a piston movably disposed within said fluid chamber to divide the fluid chamber into first and second chambers, said piston being formed with a circular recess on one surface thereof;

a resilient member disposed within said circular recess and defining a vortex chamber together with said piston, said resilient member having means for defining first and second fluid passages for communication between said first chamber and said vortex chamber, said second passage being normally closed and responsive to a pressure difference between said first chamber and said vortex chamber greater than a set pressure provided by said resilient member to open; and

means for establishing communication between said second chamber and said vortex chamber so that the fluid flowing into said vortex chamber from said second chamber generates a vortex in said vortex chamber.

4,407,398
DRIVE UNIT

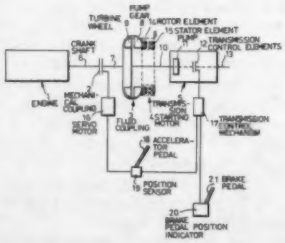
Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,674

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016620

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.055 **4 Claims**



1. An improved drive unit for a vehicle including a reciprocating-piston internal combustion engine having a crankshaft, comprising a multiple-gear automatic transmission and a clutch interposed between said engine and said automatic transmission, said transmission operating as a function of the operating condition of the vehicle, said clutch comprising a mechanical coupling part, and a fluid coupling part which serves as the flywheel mass for said engine, wherein said mechanical coupling part is interposed between said crankshaft and said flywheel mass, said fluid coupling part further comprising means for connecting said fluid coupling part with an input shaft of said transmission, and pump means for connecting said fluid coupling part to an auxiliary starting motor, said auxiliary starting motor selectively operating as a generator to charge a battery of said vehicle and as a motor to maintain a predetermined rotational speed of said fluid coupling part during engine-braking and stopping operating conditions of said vehicle.

4,407,399
TWO-SPEED TRANSMISSION WITH HYDRAULIC ACTUATION OF THE SHIFTING OPERATIONS UNDER LOAD

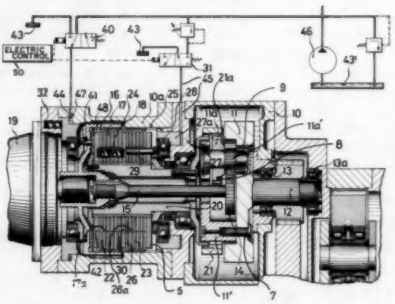
Friedrich Wolff, Wetter, Fed. Rep. of Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 230,079

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003831

Int. Cl.³ B60K *41/28*; G05G *1/00*

U.S. Cl. 192—4 A **12 Claims**



1. In a two-speed transmission with hydraulic actuation of the shifting operations under load for a hydrostatically operated work machine, particularly caterpillar-track excavators, having a planetary gearing provided with double planet gears, a sun gear as an input member, and a brakable internal gear as a reaction member, and having packs of discs forming a clutch constituting a clutch means and a brake constituting a brake means, respectively, which discs are arranged coaxially around the axis of the sun gear of the planetary gearing, the improvement wherein

said packs of discs formed as said clutch means and said brake means, respectively, for being operatively connected to said planetary gearing,

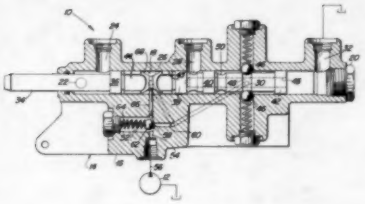
said planetary gearing includes a planet carrier means for carrying the planet gears via a bearing of the latter and for being continuously connected with a power take-off, and

said planet carrier means has a width encompassing the bearing of the planet gears and a diameter greater than the internal gear so as to be formed as a flywheel.

4,407,400
WINCH CONTROL VALVE

Gary R. Fichtinger, Hazel Green, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jan. 29, 1981, Ser. No. 229,398
Int. Cl.³ F16D 67/04; F15B 13/07
U.S. Cl. 192—12 C 4 Claims

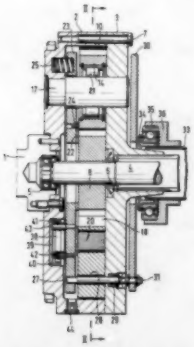


1. A winch transmission control valve comprising: a valve body defining a valve bore; sump port means, pressure port means and clutch service and brake service ports intersecting the bore at axially spaced locations therealong; a valve spool located in the bore and including fluid directing means for controlling the flow of fluid to and from the clutch and brake service ports; said fluid direction means including a first land means operable when the spool is in an inching position for simultaneously connecting the clutch service port to the sump and pressure port means to thereby effect a partial engagement of a pressure-engageable clutch to which the clutch service port is adapted for connection; and a second land means operable when the spool is in a controlled release position for simultaneously connecting the brake service port to the sump and pressure port means to thereby effect a partial disengagement of a brake to which the brake service port is adapted for connection.

4,407,401
HYDROSTATIC COUPLING

Peter Rosendahl, Düren-Lendersdorf, and Karl T. Renius, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,020
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004581
Int. Cl.³ F16D 31/04
U.S. Cl. 192—61 9 Claims

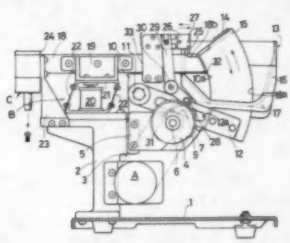


1. A hydrostatic coupling, which comprises:
a first coupling shaft;
a housing fastened on said first coupling shaft and including a plurality of recesses;
a second coupling shaft associated with said housing;
a first gear, serving as a sun gear and secured on said second coupling shaft; and
a plurality of further gears, which are contained in at least some of said recesses and are arranged in a planetary manner about said first gear in such a way as to include circulation passages, said first gear forming a geared pump with each of said further planetary gears and driving same; a sealing plate which is externally axially adjustable against spring force, and in which said housing has a smooth inner wall, said first sun gear and said further planetary gears on the one hand engaging said smooth inner wall of said housing, and on the other hand engaging said sealing plate, which, in conformity with the axial adjustment, at least partially closes said circulation passages.

4,407,402
FASTENER FEEDING APPARATUS

Masaru Nishimura; Osamu Shikata, and Yoshikuni Ohtsuka, all of Ayabe, Japan, assignors to Nitto Seiko Co., Ltd., Kyoto, Japan

Filed Jan. 22, 1981, Ser. No. 227,388
Int. Cl.³ B65G 47/24
U.S. Cl. 198—389 11 Claims



1. A fastener feeding apparatus for scooping up fasteners stored in bulk form in a hopper, orienting them in a predetermined position, and sequentially feeding them, comprising:
a movable scooping plate adapted to scoop up fasteners in a predetermined position with the fastener head facing upward and the fastener leg extending downward in a groove provided in the top surface of said scooping plate, said top surface being inclined when said scooping plate is at an upper position so that said fasteners supported in said predetermined position may slide down by gravity to the rear of said inclined top surface, said top surface of said scooping plate is in the form of a V-shaped groove at its outer end for facilitating the scooping up of said fasteners and is beveled at its inner end for facilitating the return back to said hopper of fasteners not supported in said predetermined position, said scooping plate comprising;
a scoop plate body; and
a scoop plate arm coupled to said scoop body, said scoop plate arm being supported pivotally on a vertically extending support plate extending at least partially into said hopper with a side end surface of said support plate defining a circular segment conforming to an inner peripheral face of said scoop plate body;
motive means for moving said scooping plate from said upper position to a lower position and vice versa;
a chute rail having a substantially horizontal fastener supporting face adapted to receive said fasteners supported on said scooping plate as they slide down from said scooping plate top surface and to support said fasteners by the bottom face of the head part with their heads facing upwardly and their legs loosely inserted in a chute rail

groove, a bottom face of said chute rail having a top surface of said support plate extending upwardly towards said bottom face, said chute rail further being spaced from said support plate by a slight clearance space for permitting vibration of said chute rail, the rear end faces of said chute rail being in the form of a circular segment conforming to said inner peripheral surface of said scoop plate body and is spaced therefrom by a slight clearance for permitting vibration of said chute rail relative to said scoop plate body; and

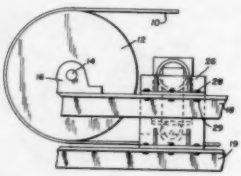
a chute rail support for supporting said chute rail in a substantially horizontal position, said chute rail support comprising a rectilinear vibrating unit for imparting a slight vibration to said chute rail and for thereby causing the fasteners supported by said chute rail to be fed in a rearward direction.

4,407,403

VIBRATORY BELT CLEANING APPARATUS FOR AN ENDLESS CONVEYOR

Theodore S. Wadensten, P.O. Box 8, Wyoming, R.I. 02898

Filed Jun. 10, 1981, Ser. No. 272,303
Int. Cl.³ B65G *45/00*
U.S. Cl. 198—494 **16 Claims**



1. A vibratory belt cleaning apparatus for an endless conveyor belt as carried by head and tail pulleys supported by a frame, said vibratory cleaning apparatus disposed immediately adjacent the tail pulley and disposed and positioned to contact the inner surface of the returning conveyor belt to locally vibrate the conveyor belt to remove unwanted particles from the exterior surface of the belt after discharge has been made from the tail pulley, the vibratory belt cleaning apparatus including:

(a) a support frame for the conveyor belt and pulleys, said frame including support shelf portions;

(b) a pair of brackets securable to said frame for rigid attachment thereto, each of said brackets disposed to provide a channel open at least to its top, said channel when the brackets are secured to the frame disposed substantially vertically;

(c) a channel shaped non-metallic liner within and secured to the channel in each bracket, said liner at least in part open toward the belt;

(d) a vibrated apparatus frame having guide portions disposed so as to be slidable in the channel shaped non-metallic liner in the secured brackets, said vibrated apparatus frame including a support plate disposed between the guide portions and on which is mountable a motor vibrator;

(e) a variable speed and force vibrator motor removably securable to the support plate of the vibrated apparatus frame, the vibrational range providing from twelve hundred to nine thousand cycles per minute, and

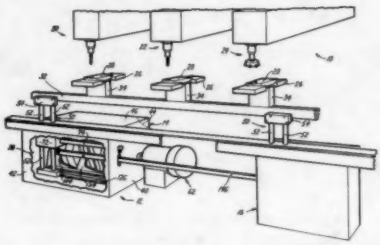
(f) a freely-turning roller carried on a shaft secured to the guide portions of the vibrated apparatus frame, said vibrated roller gravitationally engaging the inside of the returning extend of the conveyor belt while said vibrations are isolated from the conveyor support frame by the non-metallic liner within the channel of the bracket.

4,407,404

WORK TRANSFER DEVICE

William E. Rise, Utica, and Gregory J. Masserang, Farmington, both of Mich., assignors to Android Corporation, Auburn Hts., Mich.

Filed Jul. 6, 1981, Ser. No. 280,385
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—774 **23 Claims**



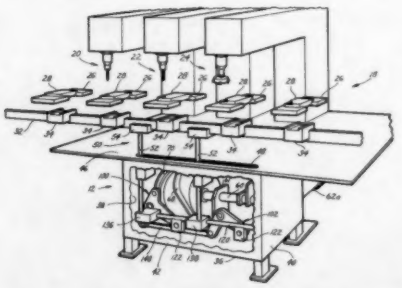
1. In a work transfer device for progressively transferring articles to successive stations having a base on which a carriage is longitudinally shiftable, work engaging means movable longitudinally with the carriage while being shiftably mounted on the carriage for transverse shiftable movement with respect to the carriage, drive means for shifting the carriage longitudinally of the base and for shifting the work engaging means transversely of the carriage so as to cause the work engaging means to execute a generally rectilinear path of movement for progressively transferring articles between successive stations, the improvement for imparting transverse motion to the work engaging means wherein there is provided a track parallel to the longitudinal travel of the carriage and wherein a track engaging means is coupled with the work engaging means so that the two move longitudinally in unison, said track engaging means riding within the track, and means operably mounting the track on the base for bodily transversely displacing the track while maintaining the track parallel with the longitudinal travel of the carriage thereby to impart transverse motion to the work engaging means.

4,407,405

WORK TRANSFER DEVICE

William E. Rise, Utica, Mich., assignor to Android Corporation, Auburn Hts., Mich.

Filed Jul. 6, 1981, Ser. No. 280,386
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—774 **14 Claims**



1. In a work transfer defice for progressively transferring articles to successive stations having a base on which a carriage means is longitudinally shiftable, work engaging means movable longitudinally with the carriage means while being shift-

ably mounted on the carriage means for transverse shiftable movement with respect to the carriage means, drive means for shifting the carriage means longitudinally of the base and for shifting the work engaging means transversely of the carriage so as to cause the work engaging means to execute a generally rectilinear path of movement for progressively transferring articles between successive stations, the improvement for imparting transverse motion to the work engaging means wherein there is provided a cylindrical guide rod parallel to the direction of carriage travel, a pair of longitudinally spaced slides which are longitudinally shiftable on the guide rod, means securing each slide to the work engaging means, a pair of bellcranks spaced longitudinally apart, means mounting the bellcranks on the base about respective longitudinally spaced pivot axes, a pair of pivot blocks secured to the guide rod at longitudinally spaced locations, each bellcrank having a crank arm connected at the distal end to a corresponding one of the pivot blocks whereby a pivot connection is provided between each crank arm and the corresponding pivot block, each bellcrank comprising a second crank arm, a drag link connecting both second crank arms together so that rocking motion of one crank arm about its pivot axis is imparted to the other crank arm and means operably coupling the two crank arms to the drive means for causing the crank arms to operate in unison to transversely displace the guide rod and thereby impart transverse motion to the work engaging means.

4,407,406

WALKING BEAM MECHANISM

Dallas G. Norris, Indianapolis, Tenn., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,943
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—774 **4 Claims**

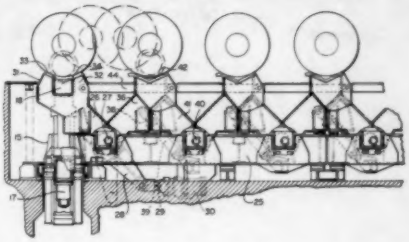
1. Walking beam apparatus comprising, a frame, a longitudinally reciprocable carriage mounted by said frame, carriage positioning means for longitudinally positioning said carriage and including for that-purpose carriage drive means adapted to undergo alternate longitudinal forward and reverse strokes and coupled to said carriage by a lost motion coupling, said positioning means being operable such that, during a first interval of each of such strokes, such carriage and drive means are uncoupled while said carriage remains stationary and, during a second interval of each of such strokes, such carriage and drive means are coupled to move longitudinally together, a walking beam, movable beam support means fixedly coupled to said beam and slidably coupled with said carriage so as to render said beam longitudinally movable therewith and laterally movable with respect thereto, guide means on said carriage for constraining lateral movement of such support means and beam to be normal to the longitudinal movement of said carriage, and link means coupled between said drive means and support means and pivotally coupled to each thereof, said link means being responsive to changes in the relative positioning of such carriage and drive means during the first interval of, respectively, each such forward stroke and subsequent reverse stroke to displace said support means to, respectively, a laterally outward position and a laterally inward position, the combined movements of such carriage and support means being adapted to cause said beam to undergo a rectangular movement in the course of each such forward stroke and subsequent reverse stroke.

4,407,407

METHOD FOR ROTATING AND CONVEYING COILS

Werner W. Elbe, McCandless Township, Allegheny County, Pa., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 972,903, Dec. 26, 1978, Pat. No. 4,271,959.
This application Mar. 18, 1981, Ser. No. 245,115
Int. Cl.³ B65G *25/04*
U.S. Cl. 198—777 **3 Claims**



1. The method of conveying successive hot coils in the eye horizontal position along a path of travel of the coil axis normal thereto and defined by successive arcuate segments, each segment intersecting its adjoining segments, comprising transferring each said coil between swinging transfer members at a location within each path segment, and also transferring said coil between swinging transfer members at each intersection of said path segments, the coil at each transfer being simultaneously supported by the overlapping free ends of said transfer members whereby it is rotated but not rolled during transfer.

4,407,408

FEED CONVEYOR

David A. Olson, 1708 Roberts Dr., Albert Lea, Minn. 56007

Filed Dec. 5, 1980, Ser. No. 213,420
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—621 **20 Claims**

1. A conveyor to convey particulate material in a forward longitudinal direction, comprising:

a first elongate sidewall and a second elongate sidewall, both generally longitudinally orientated and disposed in generally parallel spaced apart relationship to one another;

power means connected to at least one of the sidewalls operable to move the sidewalls in reciprocal fashion;

link means connecting the first and second sidewalls whereby upon operation of the power means the sidewalls move sequentially between a first spaced apart position with said sidewalls having particulate material disposed between them; inwardly to a second position wherein the sidewalls are moved toward one another to an extent that particulate matter is clamped between them; forwardly to a third position wherein the sidewalls and particulate material are moved forward; outwardly to a fourth position wherein the sidewalls are moved away from each other to unclamp the particulate material; and then rearwardly wherein the sidewalls are returned to the first position, said link means including means limiting movement of the sidewalls toward each other during rearward movement; and

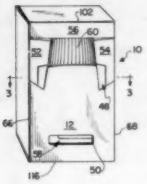
means supporting the sidewalls and permitting movement thereof.

4,407,409

CARTON WITH SUSPENSION SUPPORT AND BLANK FOR FORMING SAME

Daniel P. Dutcher, Woodbury, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 150,729, May 19, 1980, abandoned.
This application Mar. 23, 1982, Ser. No. 361,530
Int. Cl.³ B65D *25/00*
U.S. Cl. 206—45.31 **1 Claim**



1. A carton for suspending a capped breakable container therein, the cap having a laterally extending skirt extending outwardly of the container portion below and immediately adjacent thereto, said carton comprising:

a front panel;

first and second side panels hingedly coupled at opposite side edges of said front panel along fold lines;

top and bottom cover means coupled to top and bottom edges, respectively, of said panels; and

collapsible support means for providing a support surface intermediate said top and bottom cover means substantially perpendicular to and between said front and back panels for supporting said container on the bottom edge of its cap with the bottom of the container spaced above said bottom cover means;

said support means comprising first and second parallel bridge panels having upper edges forming said support surface, each of said bridge panels being a leg of a U-shaped member having a base panel fixed to said front panel;

said legs being hingedly coupled to opposite side edges of said base panel along fold lines and secured to said back panel by means of glue flaps hingedly coupled to side edges of said legs remote from said base panel;

first and second front flaps formed in said front panel above said support means for forming an opening in said front panel;

said front flaps being hingedly coupled at opposite side edges of said front panel and defined by slits formed in said front panel to permit said front flaps to be folded into the interior of the carton and behind the container cap at an angle of inclination with respect to said back panel.

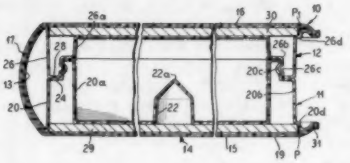
4,407,410

BOOK TYPE CASSETTE HOLDER AND METHOD OF MAKING SAME

Herbert Graetz, Chicago, Ill., and Ronald C. Unterreiner, Cape Girardeau, Mo., assignors to Blair Industries, Inc., Scott City, Mo.

Filed May 7, 1982, Ser. No. 376,147
Int. Cl.³ B65D *85/67*
U.S. Cl. 206—387 **15 Claims**

1. A book style holder comprising a first one-piece flexible sheet having integral front and rear flap portions and an integral spine portion between the flap portions connecting the flap portions in laterally spaced side-by-side relation, a second one-piece stiff molded sheet having a raised tray portion on the inner face of each flap portion of said first sheet and an integral spine liner portion between the tray portions connecting the tray portions in laterally spaced side-by-side relation and covering the spine portion of said first sheet, a bond connecting said first and second sheets together around the peripheries thereof, the tray portions on the front and rear flap portions being complementary to stack together in the closed position



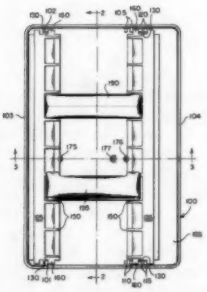
of the holder, and said flexible spine and spine liner having a greater width than the stacked height of the tray portions to bow outwardly to form a convex arcuate front end for the holder and flexing across their entire widths to a flat position when the holder is opened.

4,407,411

STORAGE BOX

Alan Lowry, Canton, Mass., assignor to Hartzell Manufacturing, Inc., St. Paul, Minn.

Filed Jun. 24, 1982, Ser. No. 391,549
Int. Cl.³ B65D *85/67, 85/30, 5/48, 5/50*
U.S. Cl. 206—387 **10 Claims**



1. A storage box for a plurality of flat, generally rectangular objects comprising:

a box-like housing,

at least two rack members slidably insertable into said housing, each of said rack members comprising a central planar portion and two sets of ribs, one of said rib sets being mounted perpendicularly on each side of said planar portion with equal spacing therebetween, said spacing of said ribs mounted on one side of said planar portion being different from said spacing of said ribs mounted on the other side of said planar portion, and

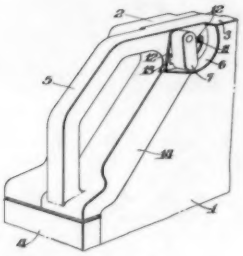
means for mounting said rack members in spaced, parallel relationship within said housing whereby one set of ribs on one of said rack members and one set of ribs on one of said other rack members form slots for storing said objects.

4,407,412

PLASTICS SPOOL CONTAINER FOR MAGNETIC TAPES

Hartmut Thiele, Munich; Dieter Schmelter, Poecking, and Rainer Posch, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 274,821
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 8016911
Int. Cl.³ B65D *85/02, 45/06;* E05C *3/12*
U.S. Cl. 206—404 2 Claims



1. A container for magnetic tapes having at least two parts hinged together comprising

a bottom case part having a housing portion of the bottom case part

a covering case part foldably connected to said bottom case part by hinging means and disposed to provide a closed container in the folded-together position,

said container in closed position having a narrow front side and another adjacent narrow side and said container being formed to provide a handle at a corner between the front and said adjacent narrow side,

a segment-shaped cavity formed in said container which is adjacent to both said handle and said adjacent narrow side, having a lateral wall of said cavity,

a groove formed in said lateral wall and indentations formed within said groove and in said lateral wall,

a hole opening into a recess formed in the housing portion of the bottom part,

so constructed and arranged that,

when said parts are folded into closed position, said lateral wall is adjacent to the hole opening in the recess formed in the housing portion of the bottom case part,

a locking toggle having a peg member which is mounted in said lateral wall and extends into said hole opening into said recess formed in the housing portion of the bottom case part,

a single arm of said toggle pivotally mounted on an end of the peg and pivotable between a first and a second toggle position,

a projection formed on said arm to be positioned in said grooves and engage said indentations, said projection engageable in said indentations in the respective first and second toggle positions,

a barb on the end of the peg opposite the single arm insertable through the hole opening into said recess, said barb and recess being adapted to each other so that the barb engages the housing in one of said positions,

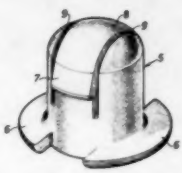
whereby the barb and the housing on the bottom case by engagement of the barb with the bottom case part and the arm with the covering case part pushes the bottom case part and the covering case part, respectively closely together with the locking toggle arrested by engagement of the projection and an indentation.

4,407,413

DISPLAY PACK

Erik C. Jansson, Enköping, Sweden, assignor to Aktiebolaget Bahco Verktyg, Enköping, Sweden

Continuation of Ser. No. 254,587, Apr. 14, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 405,721
Claims priority, application Sweden, Apr. 18, 1980, 8002935
Int. Cl.³ B65D *73/00*
U.S. Cl. 206—493 2 Claims



1. A hanging display pack comprising a backing plate or lamina preferably with attachment details such as buckles, eyelets, pockets etc. for removable retention of an article on the lamina, the article having a preferably circular hole in a portion thereof situated substantially parallel to the lamina, which has a hole adapted in respect of size and position for coaction with the hole of the article, there being a locking body adapted for insertion through the hole of the lamina and the hole of the article, and substantially filling out said hole for mutually locking the lamina and article together by means of a flange like projection preventing said body from going completely through the hole of the lamina, said projection thus being situated on the side of the lamina facing away from the article, said body also having snap teeth at its insertion end, said teeth being resiliently adapted for snapping out after they have been inserted through the hole of the article, when they will be situated on the side of the article facing away from the lamina, said body being made from elastic material, preferably plastics, characterized in that said body is formed as a cupola with a substantially cylindrical portion, at its base provided with said projection and at its opposing end having a hemispherical top, forming its insertion end, said teeth being located along two mutually opposing areas along the circumference of said cylindrical portion and the remainder of the circumference being without teeth, and formed with at least one through-slit, which is disposed on or parallel to a line, preferably a line of symmetry, between said two mutually opposing areas having the snap teeth such that in order to release said locking body pressure must be applied against the sides of said cylindrical portion in a direction substantially parallel to said line.

4,407,414

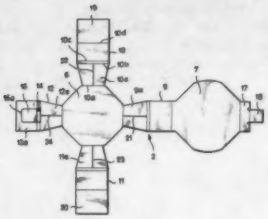
WRAPPER FOR KITCHEN UTENSILS

Pierre Rey, and Emile Bonnet, both of Rumilly, France, assignors to SEB S.A., Selongey, France

Filed Sep. 9, 1982, Ser. No. 416,958
Claims priority, application France, Sep. 30, 1981, 81 18393
Int. Cl.³ B65D *6/04*
U.S. Cl. 206—553 14 Claims

1. A wrapper for kitchen utensils which have a bottom wall and a side wall, said wrapper being made from a sheet of semi-rigid foldable material such a paperboard having two planar surfaces which are cut-out of the sheet to a size approximate the area of the bottom wall, said two surfaces being applied respectively against the internal face and the external face of the bottom of the utensil, wherein the two surfaces aforesaid are joined to each other by means of at least three

tongues spaced at intervals around the side wall of the utensil, said tongues being adapted to cover the top rim of said side



wall and being applied against the internal and external faces of said wall.

4,407,415

METHOD OF GRADE DETERMINATION INCLUDING COMPENSATION

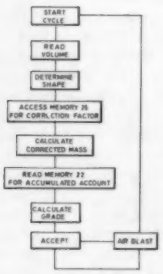
Rolf C. Böhme, Kyalami, and Max M. Lazerson, Northcliff, both of South Africa, assignors to General Mining Union Corporation Limited, South Africa

Filed Nov. 28, 1980, Ser. No. 211,444

Claims priority, application South Africa, Dec. 4, 1979, 79/6566; Jul. 15, 1980, 80/4249

Int. Cl.³ B07C 5/00, 5/346

U.S. Cl. 209—556 5 Claims



1. A method of determining the grade of a radioactive particle which includes the steps of obtaining a measure of the radioactivity of the particle, obtaining a measure of the volume of the particle, deriving a measure of the particle's mass from the volume measurement, deriving a grade measurement of the particle from the ratio of the radioactivity measure to the mass measure, and correcting the grade measurement by applying a corrective factor which is dependent on the mass of the particle.

4,407,416

MOUNTING FRAME SYSTEM FOR CIRCUIT BOARDS

Dale L. Anderson, Mound, Minn., assignor to Protronix, Inc., Minneapolis, Minn.

Filed Jul. 16, 1980, Ser. No. 169,294

Int. Cl.³ A47F 5/00, 7/00

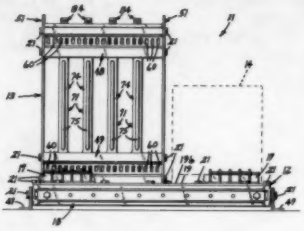
U.S. Cl. 211—41 20 Claims

1. A universal rail member usable in selected lengths in a modular frame assembly, comprising:

(a) an elongated web;

(b) a pair of first ridge members projecting laterally outward from one side of the web, the first ridge members extending over the length of the web in spaced, parallel relation;

(c) a pair of second ridge members projecting laterally outward from the opposite side of the web, the second ridge members extending over the length of the web in parallel relation and spaced apart so that the first ridges of one rail member are capable of engaging and interlockably fitting between the second ridge members of another rail member;



(d) and at least one notch formed in each of the second ridge members, the notches being transversely aligned, and sized and configured to receive the end of another rail member in perpendicular, interlocking relation.

4,407,417

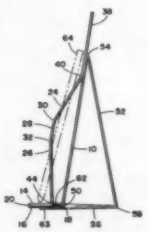
PRODUCT COUNTER DISPLAY

Daniel J. Boyle, Hartland, Wis., assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 22, 1980, Ser. No. 219,248

Int. Cl.³ A47F 7/00

U.S. Cl. 211—69.1 2 Claims



1. A product holder for displaying axially elongated products, such as pencils and the like, said holder comprising:

(a) a face panel comprising a center panel, a top extension panel foldably connected to a top edge of said center panel, and a bottom extension panel foldably connected to a bottom edge of said center panel, said top and bottom extension panels being provided with at least one pair of aligned apertures for receiving and displaying an elongated product;

(b) a base support comprising an upper base panel foldably connected to a bottom edge of said bottom extension panel along a first fold line, a lower base panel foldably connected to said upper base panel and adhesively secured to a lower surface of said upper base panel;

(c) a back panel foldably connected to said lower base panel along a second fold line which is offset from said first fold line;

(d) a glue panel foldably connected to a top edge of said top extension panel, said glue panel being adhesively secured to a top portion of said back panel;

(e) a stand panel foldably connected to a top edge of said back panel;

(f) a stand support panel foldably connected to a bottom edge of said stand panel;

(g) said first and second fold lines being operable, by reason

of being offset from each other, to convert said holder from a flattened shipping condition to an expanded operable condition when said upper and lower base panels are pivoted from a first position substantially coplanar with said back panel to a second position substantially perpendicular to said back panel, said face panel being outwardly offset from said back panel when said holder is in said expanded operable condition; and

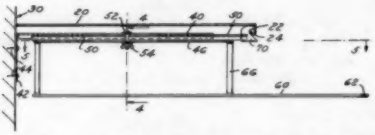
(h) means for securing said stand support panel in a supporting position substantially coplanar with said base support when said holder is in said expanded operable condition.

4,407,418

ADJUSTABLE TIE RACK

John W. Brammer, 27622 Parkview Blvd., Apt. #323, Warren, Mich. 48092

Filed May 28, 1981, Ser. No. 267,786
Int. Cl.³ A47F 7/12
U.S. Cl. 211—87 **8 Claims**



1. A support rack for use under a horizontal closet shelf having a clothes hanger support near the front edge which comprises:

(a) a first elongate plate having a tab to fasten to a closet wall,

(b) a second elongate plate adjustably slidable in relation to said first plate,

(c) means on said second plate to engage and be supported by a clothes hanger support,

(d) means to lock said plates in a longitudinally adjusted position, and

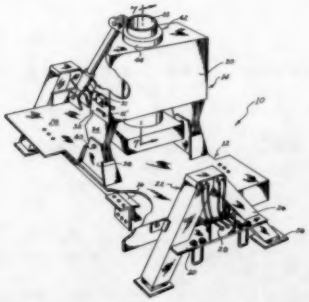
(e) a frame suspended from one of said plates having legs parallel to and below said elongate plates to support ties and the like.

4,407,419

PORTABLE BOOM SUPPORT FOR VEHICLES

Shannon K. Clements, 6216 Locust Dr., Evansville, Ind. 47712

Filed Dec. 30, 1981, Ser. No. 335,752
Int. Cl.³ B66C 23/78
U.S. Cl. 212—189 **1 Claim**



1. A boom support assembly for a vehicle with frame members, said assembly comprising: a frame with upper and lower horizontally disposed plate means, spaced rigid beams mounted between said upper and lower plate means;

adjustable outriggers mounted at each end of said plate means for adjustably positioning said frame relative to a supporting surface to maintain said frame in a selected position;

a turntable support including spaced plates and side panels forming a generally rectangular unit, means pivotally mounting said turntable suport on said upper plate means for movement about a horizontal axis, a vertically tubular member open at it upper and lower ends and fixedly mounted in said unit, a shaft, vertically spaced bearings mounted in said tubular member for rotatably supporting said shaft therein, means operatively connected to the lower end of said shaft for rotating said shaft about a generally vertical axis, bracket means mounted on the upper end of said shaft for pivotally supporting a boom thereon:

means for pivoting said turntable support about said horizontal axis, control means mounted on said unit for actuating said means for pivoting said turntable; and

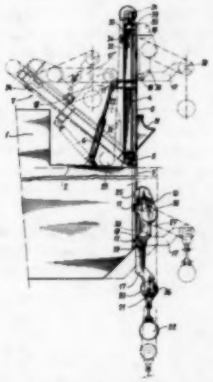
means mounted on said upper and lower plate means and spaced beams for attaching said frame to said frame members of said vehicle.

4,407,420

SHIP COMPRISING ONE OR MORE DERRICKS SUCH AS A DREDGE WITH SUCTION PIPE DERRICKS

Arie de Jager, Sliedrecht, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed Aug. 3, 1981, Ser. No. 289,382
Claims priority, application Netherlands, Aug. 4, 1980, 8004436
Int. Cl.³ B66C 23/18
U.S. Cl. 212—199 **8 Claims**



1. In a ship having a derrick on deck along a side of the ship to handle the suction tube of a dredge, means mounting the derrick for vertical swinging movement about a horizontal axis from an inboard position toward a position in which the suction tube can be lowered outboard and vice versa, means for swinging the derrick about said horizontal axis, a hoisting winch having a hoisting cable, a hoist block for carrying the suction tube, said hoist block being disposed outboard in the latter said position of said derrick, pulleys about which said cable extends to said hoist block, guiding tracks on said derrick, guiding tracks on the hull of the ship, and a sliding piece slidable along the guiding tracks on said derrick and on said ship between an upper position on the guiding tracks of said derrick and a lower position on the guiding tracks of said ship; the improvement comprising a crane jib on said sliding piece having an outer end carrying said hoisting block, said guiding tracks on the hull of the ship being disposed within the profile

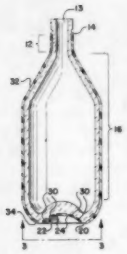
of the side wall of the ship, and said cable having a portion disposed between the guiding tracks of the derrick and between the guiding tracks of the ship inwardly of the profile of said side wall of the ship when said sliding piece is in said lower position.

4,407,421

GLASS CONTAINER HAVING MEANS FOR REDUCING BREAKAGE AND SHATTERING

Robert E. Waugh, Columbus, Ohio, assignor to The D. L. Auld Company, Columbus, Ohio

Filed Dec. 16, 1981, Ser. No. 331,420
Int. Cl.³ B65D *23/08*
U.S. Cl. 215—12 R **8 Claims**



1. In a glass container of the type which is designed to be coated with a plastic material to reduce breakage and shattering comprising a neck portion which terminates in a discharge opening, a mid-portion, and a base, said base presenting a bearing surface upon which said bottle stands, the improvement wherein:

said base comprises a plurality of concentric annular ribs as longitudinal extensions defining first and second annular channels, said channels being concentric about the center of said base with said first channel being outside said second channel and said second channel surrounding a reservoir,

said channels being filled with a charge of cast plastic, and

said channels and reservoir being designed such that they aid in preventing said container from shattering when filled with a charge of cast plastic.

4,407,422

COMPOSITE CLOSURE

Sheldon L. Wilde; Thomas J. McCandless, both of Crawfordsville, and Robert M. Saunders, Ladaga, all of Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.

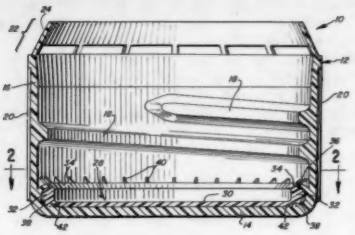
Continuation-in-part of Ser. No. 270,241, Jun. 4, 1981, Pat. No. 4,378,893, which is a continuation-in-part of Ser. No. 77,566, Sep. 21, 1979, abandoned. This application Oct. 13, 1981, Ser. No. 310,769
Int. Cl.³ B65D *53/04*
U.S. Cl. 215—246 **31 Claims**

1. A composite closure for a container, comprising

a plastic cap having a top wall portion and an annular skirt portion having a thread formation,

a disc-shaped plastic sealing liner disposed within said cap generally adjacent said top wall portion including an annular sealing portion having a generally inwardly facing sealing surface, and

means for retaining said liner within said cap comprising a plurality of projections on the inner surface of said top



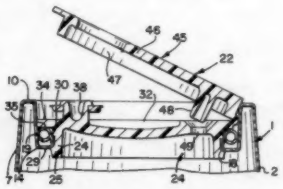
wall portion arranged in circumferentially spaced relation in a ring engaging said annular sealing portion.

4,407,423

DETACHABLE RESEALABLE CLOSURE

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Mar. 15, 1982, Ser. No. 358,164
Int. Cl.³ B65D *51/16, 39/00*
U.S. Cl. 220—260 **10 Claims**



1. A pressure-resistant assembly comprising a combination of a thin metal neck structure having a plurality of radially spaced wall portions and one of which provides a closure-receiving bore and another wall portion of which provides a support for said one portion, said one portion having radial expansion inhibiting means spanning the space between said portions, and a plastic closure comprising a radially expandable hollow plug having a seal tight fit within said one wall portion and positioned in radial alignment with said inhibiting means.

4,407,424

PLASTIC PLUG TYPE CLOSURE FOR BEVERAGE CONTAINERS

William M. Heyn, New Canaan, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Jul. 1, 1982, Ser. No. 394,231
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—269 **10 Claims**

1. A closure for a pour opening in a wall of a container, a channel on the wall inscribed within said opening,

a plastic closure having a body portion overlying the open-

ing and a rupturable web extending from one side of said body portion into said channel,

a retainer bead having a juncture with said web, said bead being positioned in said channel,

said channel having a wall crimped about said bead and having a cutting edge imbedded into said bead at said juncture for severing said web attendant to said body portion of the closure being lifted for opening said container.

4,407,425

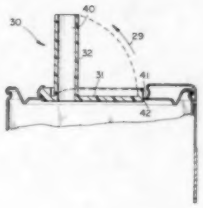
CONTAINER CLOSURE LID INCLUDING DRINKING SPOUT MEANS

Marvin Combs, 2327 Mayhew Dr., Indianapolis, Ind. 46227

Filed Feb. 22, 1982, Ser. No. 350,754

Int. Cl.³ B65D *17/32, 47/10, 47/32*

U.S. Cl. 220—269 **6 Claims**



1. A closure lid for carbonated beverage containers which comprises:

a boss portion unitary with said lid and coterminous with a pour opening disposed in said lid;

a closure strip disposed inwardly of the outer periphery of said boss portion and disposed as part of said boss portion and manually separable from said boss portion;

a flexible spout member having a unitary base portion having an outer upwardly projecting periphery which defines a spout receiving recess, a portion of said outer periphery of said base portion being secured within said boss portion; and

said flexible spout member further having unitary therewith a cylindrical resilient drinking spout portion folded over beneath said closure strip and received within said spout receiving recess in a closed condition and said resilient spout springing upwardly from said closed condition to an open condition when said closure strip is separated from said boss portion, said closure strip and said drinking spout being spaced apart in said open condition allowing oral contact with just said drinking spout, a vent being disposed in said pour opening spaced from said spout receiving recess.

6. A closure lid for beverage containers which comprises:

a boss portion unitary with said lid;

a closure strip disposed as part of said boss portion and manually separable from said boss portion;

a flexible spout member having a base portion secured within said boss portion and a resilient drinking spout portion folded over beneath said closure strip in a closed condition and being upwardly and pivotally movable to an open condition when said closure strip is separated from said boss portion; and

a vent opening defined by said base portion and said closure lid, said vent opening being exposed when said closure lid is in said open condition, and said vent opening being exterior of said spout member.

4,407,426

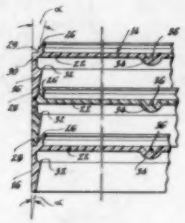
ROUND ICE CREAM CARTON LID

Edwin C. McLaren, Apple Valley, and David J. Adamek, Minneapolis, both of Minn., assignors to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 137,453, Apr. 4, 1980, Pat. No. 4,305,524. This application Apr. 13, 1981, Ser. No. 253,304

Int. Cl.³ B65D *41/18, 43/03;* **G09F** *3/20*

U.S. Cl. 220—306 **7 Claims**



1. A closure for an ice cream carton or the like of the type having a circular rim defining a dispensing opening therein, comprising:

a unitary, circularly shaped lid including a circular disc having on its top surface a concentric continuous uninterrupted bead which has a lower portion and an upwardly and inwardly extending continuous uninterrupted annular upper overhanging extremity portion having an inwardly angled outer surface and an inwardly angled inner surface,

said lower portion having an outer angled surface and a substantially straight inner surface,

said lid further including an annular skirt portion depending downwardly from the periphery of said circular disc,

a smooth annular portion of said top surface extending between said bead and the periphery of said disc, said annular portion being on the same plane as said lid portion,

said skirt portion including an upper and lower portion, having a smooth contiguous outer surface and the inner surface of said upper skirt portion being recessed radially inwardly with respect to the inner surface of the lower portion of said skirt to define a locking shoulder therebetween, and

the inner surface of said lower skirt portion being flared outwardly at an acute angle with respect to the vertical.

4,407,427

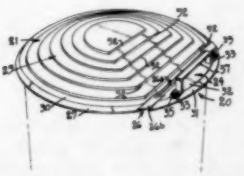
INTEGRAL HINGE COVERS FOR WASTE CONTAINER

Edward J. Reuter, 5215 Howard's Point Rd., Excelsior, Minn. 55331

Filed Apr. 30, 1982, Ser. No. 373,689

Int. Cl.³ B65D *43/14, 51/04*

U.S. Cl. 220—339 **11 Claims**



1. A homogeneous container cover of stiff but flexible material comprising a first portion, a second portion and an interconnecting portion integral with said first and second portions for enabling hinging relative motion therebetween, said interconnecting portion being configured as one or more parallel ridges and grooves formed in said cover forming a generally

saw tooth configuration, said ridges and grooves extending across said cover, but stopping short of the peripheral edge of said cover, and a pair of hinge areas free of said ridges and grooves extending from the termination thereof to the outer periphery of the cover.

4,407,428

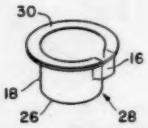
CAP FOR A PAPER CORE

Harris E. Stone, 293 Lenox St., Norwood, Mass. 02062

Filed Mar. 6, 1981, Ser. No. 241,394

Int. Cl.³ F24M *3/00*

U.S. Cl. 220—356 **2 Claims**



1. A strengthened cap for a paper core comprising:
(a) a cylindrical tube, having an upper portion and a lower portion, said lower portion terminating in a slight bead to facilitate the insertion thereof into said paper core;
(b) a socket protruding radially from said upper portion of said tube; and
(c) a circular uniform-sized rim of constant inside and outside diameter formed outwardly and at the top of said tube, said uniform-sized rim giving added structural strength to said protruding socket.

4,407,429

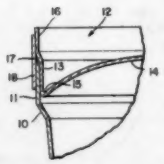
CAP FOR AND IN COMBINATION WITH A CONTAINER

Ihab M. Hekal, Stamford, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 21, 1982, Ser. No. 370,648

Int. Cl.³ B65D *41/00*

U.S. Cl. 220—359 **10 Claims**



1. A cap for a preselected container having a mouth defined by a cylindrical terminal container portion of a preselected wall thickness, said cap comprising a cylindrical mounting wall, an axially outwardly domed panel within said mounting wall and secured to said mounting wall by a radius, a cylindrical securing wall forming an axial extension of said mounting wall, said securing wall being of a greater diameter than said mounting wall by twice said preselected wall thickness and being joined to said mounting wall by a radially offset intermediate wall.

4,407,430

APPARATUS FOR DELIVERING MERCHANDISE FROM A VENDING MACHINE

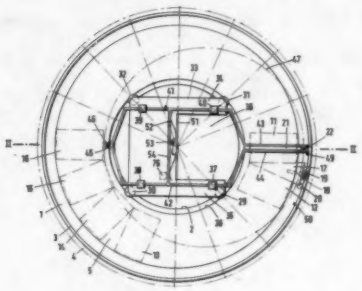
Rolf Nehrkorn, Weender Strasse 63, 3400 Göttingen, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,853

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015183

Int. Cl.³ B65G *59/06*

U.S. Cl. 221—122 **10 Claims**



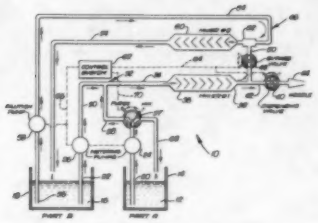
1. Apparatus for delivering merchandise from vending machines, comprising
juxtaposed storage columns for merchandise, each of said columns including wall portions for guiding merchandise packages, said wall portions defining at the bottom of said column at least one ejector-receiving slot and one exit slot longitudinally aligned with said ejector-receiving slot,
an ejector guide,
an ejector, which is reciprocable in said ejector guide and adapted to enter the ejector-receiving slot,
an element which interengages with the ejector and is movable past all storage columns,
drive means for driving said element,
first coupling means operable to selectively couple said ejector guide to said element, and
second coupling means operable to selectively couple said ejector guide to parts of the apparatus which are rigid with respective ones of said storage columns,
said ejector guide being movable into alignment with each of said storage columns in unison with said element when said first coupling means have been operated,
said second coupling means being arranged to be operated in response to the alignment of said ejector guide with a selected one of said storage columns and to impart by said operation to said ejector guide a longitudinal movement toward said selected storage column,
said first coupling means being arranged to be released in response to said alignment of said ejector guide with said selected storage column,
said ejector being arranged to be reciprocated in said ejector guide and under said selected storage column in said ejector-receiving slot in response to a continued movement of said element when said ejector guide has been aligned with said storage column and said second coupling means have been operated,
an exit opening being provided at one end of the ejector guide.

4,407,431

SYSTEM FOR DISPENSING CURABLE COMPOSITIONS

Charles G. Hutter, III, 4110 County Line, Carson City, Nev. 89701

Filed Mar. 4, 1981, Ser. No. 240,470
Int. Cl.³ B01F 15/02; B67D 5/60
U.S. Cl. 222—1 42 Claims



1. A method of dispensing a curable composition formed by a mixture of first and second materials, comprising the steps of:

controllably supplying the first and second materials from respective reservoirs to a first mixing device for mixture thereof to form the composition;

dispensing the composition from the first mixing device in a first condition of operation through a dispensing nozzle;

supplying the composition in a second condition of operation to a second mixing device;

supplying a diluent stream of the first material during the second condition of operation to the second mixing device in sufficient quantity for mixture therein with the composition to form a diluted mixture having a concentration level of the second material sufficiently low to prevent curing of the diluted mixture for a substantial period of time; and

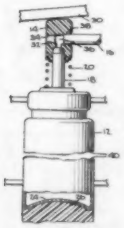
returning the diluted mixture to the reservoir of the first material.

4,407,432

PRESSURE RELIEF SYSTEM FOR PRESSURIZED GAS CONTAINERS

Daniel Shichman, Trumbull, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Dec. 22, 1980, Ser. No. 218,549
Int. Cl.³ B65D 83/00
U.S. Cl. 222—54 6 Claims



1. A low-cost over-pressure safety venting system for a pressurized gas container in a disposable gas-powered medical device wherein depressing the gas discharge element located on top of the container during normal operation allows gas to leave the container through a first passageway in the discharge element and pass to the other portions of the device to power the device, said container located in a housing; said safety venting system comprising:

(a) a second passageway in the gas discharge element through which gas passes when the gas discharge element is depressed and the passageway is not obstructed, said first and second passageways being fluidly connected;

(b) a safety plug of material having a predetermined melting point obstructing the second passageway when the plug is in an unmelted state;

(c) a bottom on the gas container that expands outward when the gas temperature is approximately equal to the melting point of the safety plug;

(d) a top member in the housing located close to the gas discharge element; and

(e) a bottom member in the housing against which the bottom of the container pushes when the container bottom expands outward, thereby causing the rest of the container to move toward the top member;

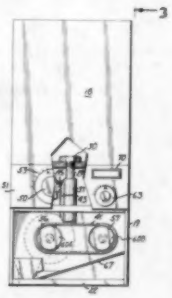
the top and bottom members being close enough to each other so that movement of the rest of the container toward the top member brings the gas discharge element into contact with the top member and forces the gas discharge member to be depressed, thereby venting the container and the other portions of the device containing pressurized gas through the second passageway.

4,407,433

CONVEYOR WITH TELESCOPIC FEED TUBE

James D. Schroeder, Anoka, Minn., assignor to Accu-Feed Corp., Anoka, Minn.

Filed Jul. 1, 1980, Ser. No. 164,893
Int. Cl.³ B67D 5/14
U.S. Cl. 222—63 18 Claims

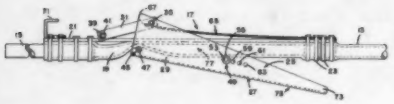


1. An apparatus for dispensing particulate material comprising: a housing having side walls defining a hopper with a hopper outlet opening; a conveyor belt assembly having a powered conveyor belt with a forward run located beneath the hopper outlet for receipt of particulate material from the hopper and delivery to a discharge location; electric motor means to regulate the speed of the forward run of the conveyor belt; metering means for carrying particulate material from the hopper outlet to the conveyor belt forward run, said metering means having a first end in communication with said hopper outlet and a second end poised over the conveyor belt forward run for deposit of particulate material onto the conveyor belt forward run; and control means to operate the electric motor means, said control means having display means to monitor electric impulses transferred to the electric motor means to drive the motor means which drives the conveyor belt, counter means for counting said electric impulses, comparator means connected to the counter means whereby, when a predetermined number of electrical impulses set in the counter means is monitored by the display means, the electric motor means is stopped.

4,407,434
APPARATUS HAVING AN IMPROVED FLOW CONTROL PINCH VALVE FOR DISPENSING FLOWABLE MATERIALS

Dennis D. Kempf, San Jose, Calif., assignor to FMC Corporation, Philadelphia, Pa.

Filed May 1, 1981, Ser. No. 259,720
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—214 **14 Claims**

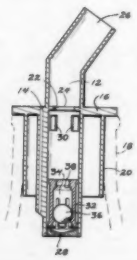


1. A pinch valve for use in dispensing measured amounts of flowable material including a support plate, an operating lever, a resilient tube between said support plate and said lever for conveying flowable material, first and second pinch means on said lever in longitudinally spaced relationship thereof, and means connecting said support plate and said lever for movement of said first and second pinch means relative to said support plate between a position in which said resilient tube is normally collapsed by said first pinch means and a position in which said resilient tube is permitted to relax from such normally collapsed condition only after said resilient tube is collapsed from a normally relaxed position by said second pinch means during movement of an end portion of said lever adjacent thereto toward said support plate, said connecting means including a pivot member on said lever between said first and second pinch means, and a resilient means extending between said support plate and said pivot member.

4,407,435
DISPENSER FOR POURING MEASURED QUANTITIES OF A LIQUID FROM A CONTAINER

James V. Harmon, 56 Pine St., Mahtomedi, Minn. 55115

Filed Jan. 21, 1982, Ser. No. 341,315
Int. Cl.³ G01F *13/00*
U.S. Cl. 222—481 **7 Claims**

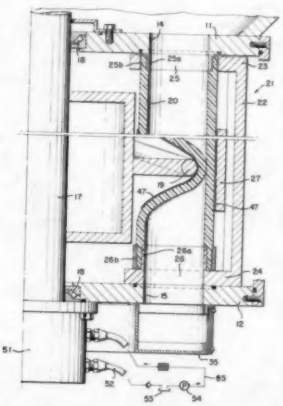


1. A dispenser for pouring measured quantities of a liquid from a container comprising a liquid discharge passage and an air vent passage extending when the dispenser is in use from the exterior of the container to the interior thereof, a sealing collar around the passages for mounting the dispenser in the container, at its upper end and a liquid control orifice toward the lower end thereof and a liquid inlet opening located between the nozzle and the orifice, said inlet opening communicating when the dispenser is in use with the interior of the container, a valve element sealably and slideably engaged within the discharge passage, a duct in the valve element communicating therethrough between opposite sides of the discharge passage and a sealing body within the duct movable therein between a first position for sealing the duct when the dispenser is inverted so that the nozzle points downwardly, the valve element thereby moving at a predetermined speed toward the inlet opening under the influence of the liquid flowing into the passage through the control orifice while liquid within the container flows through the liquid inlet opening and out through the dispensing nozzle and said valve element then sealing the inlet opening and shutting off the liquid flow after a measured quantity of liquid has been dispensed, whereupon when the container and dispenser are tipped back to an upright position, the sealing body will fall under the influence of gravity to a second open position in the sealing element when the dispenser is upright allowing the sealing element to fall quickly toward the lower end of the passage ready for the start of another pouring operation.

4,407,436
METERING AND/OR FEEDING DEVICE FOR MATERIALS

John T. Broadfoot, 805 Eighth SW., Everett, Wash. 98204, and John T. Broadfoot, Jr., Rte. 3, Box 3191, Sunnyside, Wash. 98944

Filed Feb. 25, 1982, Ser. No. 352,126
Int. Cl.³ F04B *19/12*
U.S. Cl. 222—636 **11 Claims**



8. A metering and feeding device for particulate material, comprising:

a helical rod adapted to be rotated about its axis;

a plurality of vertical, open-ended, elastic-walled tubes having upper infeed ends and lower discharge ends arranged about the helical rod so that the helical rod periodically and sequentially engages and constricts each of the tubes, beginning at their upper infeed ends and progressively moving toward their lower discharge ends;

means supporting each of the elastic-walled tubes in a fixed location;

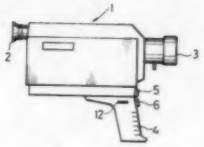
means for feeding a particulate material into each of the elastic-walled tubes; and

means to cover and uncover the upper ends of each of the tubes at selected intervals to prevent entry of the particulate material to be conveyed into the tube so that when the helical member engages the upper end of the tube to constrict the tube, that portion of the tube is substantially free of particulate material.

4,407,437
SHOULDERING AID FOR A PORTABLE TELEVISION CAMERA

Takayuki Takubo, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 30, 1981, Ser. No. 259,457
Int. Cl.³ A45F 5/00
U.S. Cl. 224—270 23 Claims



1. A shouldering aid for a portable television camera having a mechanically operable start switch and a detachable hand grip, comprising:

(a) a base member arranged to be attachable to the body of said portable television camera, said base member having a front end portion and a rear end portion, said front end portion having means for attaching said hand grip having a manipulation knob;

(b) a linking mechanism arranged to slide with respect to said base member for interlocking said manipulation knob of said hand grip and said start switch of said television camera, said linking mechanism having a generally flat and elongate plate slidably attached to said base member, and means for biasing said plate in one direction;

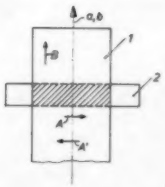
(c) a shoulder pad member attached, at a front end portion thereof, to said rear end portion of said base member; and

(d) means for fastening said shoulder pad member to said base member.

4,407,438
TRANSPORT SYSTEM FOR FLAT METALLIC MATERIALS IN STRIP MILLS

Karl-Ernst Wiechmann, Bremen, Fed. Rep. of Germany, assignor to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Jul. 13, 1981, Ser. No. 282,649
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026891; Jun. 4, 1981, 3122196
Int. Cl.³ B65H 25/26; B21C 47/34; B65G 54/02
U.S. Cl. 226—15 16 Claims



1. A system for transporting a thin hot-rolled metallic strip through a strip mill towards a feed guide, said system including

a roll table which includes a multiplicity of aligned rollers over which the thin hot-rolled metallic strip passes, the upper peripheries of said rollers forming a table plane and said roll table having a center line therethrough,

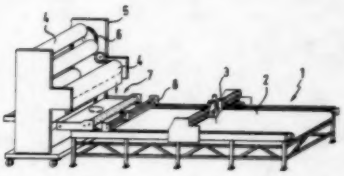
at least one linear drive element positioned between at least one pair of rollers of said roll table, each linear drive element being located below the plane of said roll table, and

a power supply means for said linear drive elements, said power supply means supplying current to said linear drive element(s) when a thin hot-rolled metallic strip passes over the roll table which is not centered over the center line of the roll table to cause the leading end of the thin metallic strip to move laterally towards the center line of the roll table.

4,407,439
APPARATUS FOR DEPOSITING A WEB OF MATERIAL ON A TABLE

Albert Buss, Munsingen, Fed. Rep. of Germany, assignor to G. O. Stumpf GmbH & Co., Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,294
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1981, 3113619
Int. Cl.³ B65H 25/26; B23Q 15/00; B26D 5/00
U.S. Cl. 226—20 8 Claims



1. An apparatus for depositing a web of flexible material on a table with one edge aligned with a datum position, said apparatus comprising:

(a) a conveyor means for advancing said flexible material to a feed rate control means;

(b) said feed rate control means providing an adjustable and controllable feed rate for said flexible material, said feed control means having a feed roller, an auxiliary roller cooperating with said feed roller, and means for controlling the speed of said feed roller;

(c) support means for said conveyor means and said feed rate control means, said support means positioned to rotate said conveyor about an axis which is substantially perpendicular to a horizontal plane of said table;

(d) a two directional rotary stepping motor coupled to said support means to vary the angular orientation of said support means and said conveyor means;

(e) a sensor means adapted to provide control signals in response to the deviation of the actual position of an edge of said web of flexible material from said datum position;

(f) control means for receiving said control signals to vary the direction of rotation and the angle of rotation imparted by said stepping motor to said support means,

whereby said flexible web is deposited on to said table in a tension free manner with said edge precisely aligned with respect to said datum position.

4,407,440
SEMICONDUCTOR DIE BONDING MACHINE

John J. Manning, San Jose, Calif., assignor to Mesa Technology, Mountain View, Calif.

Filed Feb. 23, 1981, Ser. No. 236,994
Int. Cl.³ B23K 1/12
U.S. Cl. 228—6 A 9 Claims

1. An improved semiconductor die bonding machine for electrically connecting the contact pads of a semiconductor die to the leads of a die holding member utilizing a suitable micro leadframe comprising:

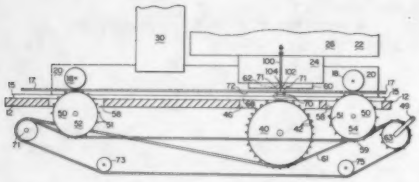
a bonding surface heated to a temperature of approximately 450° C.;

means for positioning a die holding member proximate said

bonding surface, said die holding member having a central area formed therein to which a semiconductor die is affixed such that the contact pads thereof face away from said central area and are generally aligned relative to the leads of said die holding member;

means for positioning a micro leadframe, which is one of a series of micro leadframes that are serially formed in an aluminum foil, proximate said bonding surface, such that said micro leadframe is positioned between said bonding surface and said die holding member;

means for the alignment of said micro leadframe relative to said die holding member and semiconductor die such that each lead of said micro leadframe is juxtaposed immediately above the semiconductor die contact pad and die holding member lead to which it is to be bonded;



means for causing the simultaneous movement of said aluminum foil and said die holding member such that said aluminum foil and said die holding member are caused to move in alignment beneath said bonding surface;

means for the alignment of said micro leadframe beneath said bonding surface; and

means for causing a pressing contact against said bonding surface of each lead of said micro leadframe with a semiconductor die contact pad and a die holding member lead, such that each said micro leadframe lead is bonded at one end to a contact pad and at the other end to a die holding member lead.

4,407,441

METHOD OF WELDING AN ALUMINIUM OBJECT TO A STAINLESS STEEL OBJECT

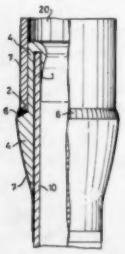
Kornelis J. Aarts, Noordwijk, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Apr. 8, 1981, Ser. No. 252,168

Claims priority, application France, Apr. 18, 1980, 80 08752

Int. Cl.[3] **B23K** *31/02;* **B64G** *1/00*

U.S. Cl. 228—176 **4 Claims**



1. A method of welding an aluminum object to a stainless steel object, comprising the steps of:

flame spraying the surface of the stainless steel object to be welded with a powder mixture including a major proportion of a metal having a high melting point and a minor proportion of aluminum to form a thin film undercoat;

flame spraying the surface of said undercoat with a layer of very pure aluminum, and

welding the aluminum object to the aluminum layer on the stainless object using very pure aluminum as a filler.

4,407,442

BI-LEVEL DUAL CELL CARTON

William H. Watson, and John E. Straw, both of St. Louis, Mo., assignors to Container Corporation of America, Chicago, Ill.

Filed Nov. 25, 1981, Ser. No. 324,771

Int. Cl.[3] **B65D** *5/48*

U.S. Cl. 229—28 R **4 Claims**

1. A bi-level, dual cell carton formed of a unitary blank of foldable sheet material such as paperboard, comprising:

(a) front and rear side wall panels and first and second end wall panels foldably joined to each other to form a tubular structure open at the ends;

(b) said end wall panels being of different heights;

(c) an internal partition panel extending between said side wall panels in parallel relation with said end wall panels to divide the interior of said tubular structure into two adjacent cells of different heights;

(d) upper and lower closure flaps joined to upper and lower edges, respectively, of said side wall and end wall panels and being folded into overlapped relation to close the upper and lower ends of said tubular structure;

(e) said upper closure flaps including an extension foldably joined to shorter of said end wall panels and including:

(i) a first section joined to an upper edge of said shorter end wall panel and folded normal thereto to overlie the shorter of said cells;

(ii) a second section joined to an inner edge of said first section and folded normal thereto against a portion of said partition panel;

(iii) a third section joined to an upper edge of said second section and folded normal thereto to overlie the taller of said cells;

(f) said upper closure flaps further including a first outer closure flap foldably joined to said front side wall panel and disposed to overlie said first section of the extension and a second outer closure flap foldably joined to said rear side wall panel and disposed to overlie said third section of the extension; and

(g) a lock flap foldably joined to an upper edge of said rear side wall panel and being folded downwardly 180° into engagement with said first outer closure flap.

4,407,443

TAMPER-INDICATING SHEET

James McCorkle, Holden, Mass., assignor to Ludlow Corporation, Needham Heights, Mass.

Filed Jan. 29, 1979, Ser. No. 7,400

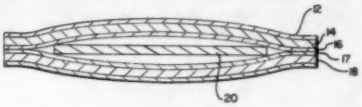
Int. Cl.[3] **B65D** *30/00;* **B42D** *15/00;* **B41M** *3/14;* **C08J** *9/16*

U.S. Cl. 383—5 **23 Claims**

1. In a thermally-sensitive blush coating comprised of a mass of light-scattering, polymeric particles which are adapted to

coalesce to a more compact coating on application of heat thereto, the improvement wherein said mass of particles is in intimate contact with a minor amount of a binder composition which, on exposure to any of a wide spectrum of aromatic or aliphatic solvents, will form means to substantially impair the light-scattering character of said mass of polymeric particles and transform said mass of particles into a more compact, normally translucent, coating.

7. A lottery ticket comprising, as an integral portion thereof, a means for detecting thermal and solvent tampering with said ticket, a blush coating comprised of a mass of light-scattering, polymeric particles which are adapted to coalesce to a more compact coating on application of heat thereto, the improvement wherein said mass of particles is in intimate contact with a minor amount of a binder composition which, on exposure to



any of a wide spectrum of aromatic or aliphatic solvents, will form means to substantially impair the light-scattering character of said mass of polymeric particles and transform said mass of particles into a more compact, normally translucent, coating.

17. In a pouch formed of a sheet material comprising (a) polymer-based cohesive seal and (b) a polymer-based coating formed of small thermoplastic polymeric particles deposited in intimate contact with another within said pouch-forming sheet material, and wherein the appearance of said based coating is irreversibly and substantially changed by subjecting said polymeric particles to temperatures of at least 140° F.

the improvement wherein said polymer-based coating comprises a binder composition with a solvent-leachable plasticizer component forming means to accelerate said change in appearance.

4,407,444

THERMOSTATICALLY CONTROLLED MIXER BATTERY

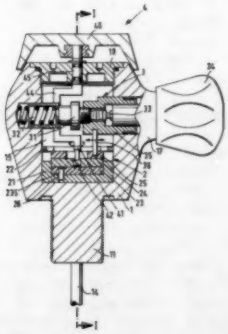
Werner Knebel, Iserlohn; Norbert Ronzon, Balve, and Eugen Weidner, Iserlohn, all of Fed. Rep. of Germany, assignors to Firma Knebel & Röttger, Iserlohn, Fed. Rep. of Germany

Filed Nov. 19,0181, Ser. No. 318,310

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3041979

Int. Cl.³ G05D *23/13*

U.S. Cl. 236—12.1 **7 Claims**



1. A thermostatically-controlled mixer battery, comprising:

a housing defining a mixing chamber and having a hot water inlet bore and a cold water inlet bore formed therein leading to said mixing chamber;

a thermostatic expansion element mounted in said mixing chamber to permit water to flow therearound, said thermostatic expansion element being adjustable within a preselected operating range so as to permit delivery of a mixture of hot and cold water at a desired temperature;

a control member coupled to, and thermostatically controlled by, said thermostatic expansion element, said control member being displaceable by said expansion element to effect opening and closing of at least one of said hot and cold water inlet bores to said mixing chamber;

a manually operable valve for regulating the quantity of the incoming hot water and cold water, said valve including a plate control means comprising at least one rotatable quantity control plate mounted in said housing and having bores formed therein, said quantity control plate being rotatable from the exterior of said housing and being so disposed as to travel over, in use, said hot and cold inlet bores such that said inlet bores are selectively alignable with said bores in said control plate, and a temperature control plate mounted in said housing and actuated by said control member and, in turn, said thermostatic expansion element, said temperature control plate being sealingly displaceable relative to said quantity control plate and having bores formed therethrough selectively alignable with said bores in said quantity control plate to allow hot water and cold water to pass therethrough into said mixing chamber.

4,407,445

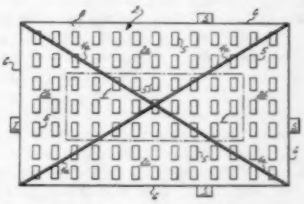
CEILING CONSTRUCTION FOR A HEATING, VENTILATION AND AIR CONDITIONING SYSTEM

Constantine Vivian, 72-11 45th Ave., Woodside, N.Y. 11377

Division of Ser. No. 19,048, Mar. 9, 1979, Pat. No. 4,258,615, which is a continuation-in-part of Ser. No. 938,576, Aug. 31, 1978, abandoned. This application Dec. 16, 1980, Ser. No. 217,376

Int. Cl.³ F24F *7/00*; F24H *3/00*

U.S. Cl. 236—49 **3 Claims**

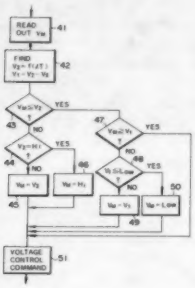


3. In a building having a heating, ventilation and air conditioning system, exterior walls and at least one story having a true ceiling, a suspended ceiling, and lighting fixtures occupying openings in the suspended ceiling, the true and suspended ceilings being vertically spaced thereby to form a plenum, the improvement comprising thermally insulating material forming an interior area of the suspended ceiling and relatively thermally transmissive material forming a perimeter area of the suspended ceiling, the exterior walls forming the periphery of said perimeter area, said perimeter area surrounding said interior area, temperature sensing means located outside said building and, operatively connected to and responsive to said temperature sensing means, a scheduled control located in a perimeter area of the story directly beneath the perimeter area of the suspended ceiling and means operatively connected to and responsive to said scheduled control for ventilating the plenum.

4,407,446
CONTROL FOR AUTOMOBILE AIR CONDITIONING SYSTEM

Tetsuya Iijima, Yamato, and Seiichi Takahashi, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 3, 1981, Ser. No. 317,862
Claims priority, application Japan, Nov. 4, 1980, 55-153720
Int. Cl.³ F24F 7/00; B60H 3/00
U.S. Cl. 236—49 **11 Claims**



1. An air quantity control system for an automobile air conditioner, comprising:

an air conditioner comprising a blower fan driven by a motor and air temperature regulating means,

a reference temperature supplier for supplying a predetermined reference temperature,

a temperature sensor for sensing the temperature of the passenger compartment of the automobile, and

blower fan speed control means connected with said reference temperature supplier and said temperature sensor for determining the speed of the blower fan and producing a control signal indicative of the determined fan speed, said control means being arranged to calculate the absolute value of the temperature difference between the reference temperature and the sensed temperature, and to determine, in accordance with the calculated absolute value, the value of a first function which increases as said absolute value increases and the value of a second function which increases as said absolute value increases and is always greater than the value of said first function, said control means determining the fan speed as being equal to the determined value of said second function if the current fan speed is greater than the determined value of said second function and as being equal to the determined value of said first function if the current fan speed is less than the determined value of said first function, while maintaining the current fan speed unchanged if the current fan speed is neither greater than the determined value of said second function nor less than the determined value of said first function, and

blower fan speed regulating means, connected with said control means, for regulating the blower fan speed in accordance with said control signal.

4,407,447
ENERGY CONTROL SYSTEM

Marshall Sayegh, Vacaville, Calif., assignor to STA-TECH International, Inc., Winters, Calif.

Filed Dec. 7, 1981, Ser. No. 328,014
Int. Cl.³ F24F 3/00, 7/00
U.S. Cl. 236—49 **11 Claims**

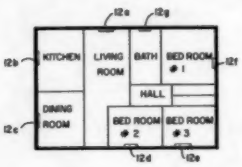
1. A fluid control system for regulating the delivery of a fluid to a region to control the temperature of said region, wherein said region having a plurality of confined spaces, said fluid generated by a generating means in response to a thermostat, and delivered to said confined spaces in a plurality of delivery channel means, said control system comprising:

a plurality of occupancy sensing means, with each occupancy sensing means for detecting the presence of a human being in a confined space, and to produce an occupancy signal in response thereto;

a plurality of valve control means with one valve control means in each of said delivery channel means, each of said valve control means for regulating the amount of fluid passing through said delivery channel means in response to a control signal;

a plurality of temperature sensing means, with each temperature sensing means for measuring the temperature of each confined space and for producing a temperature signal in response thereto; and

logic means for receiving said plurality of occupancy signals and temperature signals and for producing control signals to activate the valve control means to direct the delivery



of said fluid to the confined spaces in accordance with the following priority until the capacity of said generating means is reached:

(a) all occupied confined spaces as detected by the occupancy sensing means, wherein the temperature signal of each occupied confined space is compared to said thermostat and in the event the temperature of said occupied confined space is insufficient, said logic means is adapted to control the valve control means to deliver said fluid to said occupied confined spaces until the temperature of said space is sufficient; and

(b) unoccupied confined spaces in accordance with the following priority, wherein the temperature signal of each unoccupied confined space is compared to said thermostat, and said logic means is adapted to control the valve control means to deliver the fluid to the confined space which is insufficient and which has the highest differential between the temperature of said confined space and said thermostat.

4,407,448
TEMPERATURE SENSING VALVE

Minoru Yamanaka, Toyota; Mitsuyuki Suzuki, Gamagoori; Hideo Haneda, Toyota; Masatoshi Kato, Kariya, and Masataka Ohtsuki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 28, 1981, Ser. No. 297,276
Claims priority, application Japan, Aug. 29, 1980, 55/120102
Int. Cl.³ G05D 23/26
U.S. Cl. 236—88 **4 Claims**

1. A temperature sensing valve comprising:

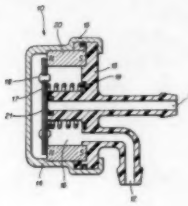
a casing having an internal fluid passage member formed therein and forming a valve seat;

a fixed permanent magnet mounted in said casing;

a movable valve body which comprises a magnetically soft, amorphous metal member supported in a thermally sensitive region of said casing for movement between a first and second position engaging said seat and being disengaged from said seat, respectively, and being magnetically coupled to said permanent magnet so that flow through said fluid passage member can be interrupted in response to magnetic excitement of said valve body; and

spring means for urging said valve body to permit fluid flow

through said fluid passage member wherein when the temperature of said thermally sensitive region is below the Curie point of said valve body, said valve body is excited by said permanent magnet so as to maintain said fluid passage member closed against the biasing force of said spring means whereas when the temperature of said thermally sensitive region reaches the Curie point of said



valve body, said valve body comprises a paramagnetic body and is no longer excited by said permanent magnet so as to be displaced by said biasing force of said spring means to said second position for flow of said fluid through said fluid passage member and wherein said spring means is located radially within said permanent magnet and said valve seat is located radially within said spring means.

4,407,449

SYSTEM FOR HEATING THE SERVICE CABIN OF A MACHINE OPERATED BY AN INTERNAL CUMBUSTION ENGINE

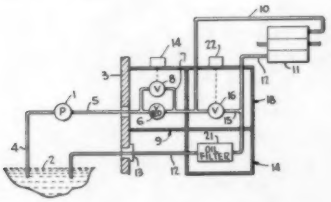
Gottfried Moser, Bergisch Gladbach; Walter Nau, Cologne, and Ernst D. Neumann, Aachen, all of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 315,857

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3043457

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 R **5 Claims**



1. A system for heating the service cabin of a machine operated by an internal combustion engine, wherein heated oil is fed by a high-pressure supply pump from the engine oil sump through an oil conduit and returned to the oil sump, a pressure-reducing element in said conduit for elevating the temperature of the oil flowing therethrough, a first line by-passing said element and having a flow control valve therein, a heat exchanger series-connected into said conduit downstream of said element and located in the service cabin for heating the area thereof, a return line extending from said heat exchanger, the improvement wherein said pump is located inside the wall casing of said engine, a housing containing said element and said control valve, said housing being sealingly mounted on said wall casing and in communication with the inside thereof, a high-pressure section of said conduit extending from the pressure side of said pump to said element being disposed inside said wall casing, and a low-pressure section of said conduit extending from said element to said heat exchanger being disposed outwardly of said wall casing, whereby any loss of oil through said high-pressure section will be confined within said engine to thereby avoid any injury or damage outside the engine by escaping oil issuing at high pressure from said high-pressure section, and to thereby avoid exposure of the engine to danger due to an uncontrolled loss of oil.

4,407,450

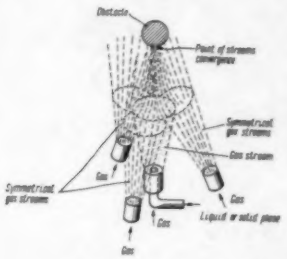
METHOD OF AERODYNAMIC PRODUCTION OF LIQUID AND SOLID DISPERSE AEROSOLS

Alexandr S. Chegolya, poselok Khiminstituta, 10 kv. 7; Vladimir A. Malykh, ulitsa Gorkogo, 86/3, kv. 54; Vladimir V. Chizhov, poselok Khiminstituta, 17, kv. 7; Viktor I. Yankov, poselok Khiminstituta, 11, kv. 11, and Nikolai I. Pirog, poselok Khiminstituta, 8, kv. 10, all of Kalinin, U.S.S.R.

Filed Oct. 30, 1980, Ser. No. 202,150

Int. Cl.³ A62C *1/12*

U.S. Cl. 239—8 **4 Claims**



1. A method of aerodynamically producing an aerosol of solid or liquid particles, comprising developing a main gas stream with entrained atomized liquid or solid particles, compressing the main gas stream radially and constricting it during axial travel thereof by application thereto of at least three converging gaseous streams symmetrically disposed circumferentially of said main gas stream and converging to a given point of convergence, impacting the compressed main gas stream with the entrained particles therein on a solid obstacle having curvature at the point of convergence of the gaseous streams, and the point of convergence being disposed on a curved surface of said obstacle on which the main gaseous stream and said particles are impacted, and the three gaseous streams constricting the main gas stream upstream of said obstacle to maintain it in a constricted state during axial travel thereof until it strikes said obstacle, whereby an aerosol dispersion of the particles is developed at said obstacle.

4,407,451

WATER PRESSURE CONTROLLED INDEXING MEANS FOR IRRIGATION SPRINKLER SYSTEM

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcos, Calif.

Filed Feb. 23, 1981, Ser. No. 236,850

Int. Cl.³ A01G *25/02*

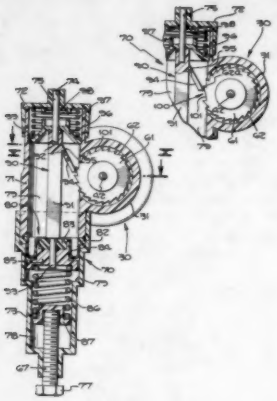
U.S. Cl. 239—66 **18 Claims**

10. In a water pilot valve having a water pressure controlled indexing means for operating said valve between opened and closed conditions, the improvement comprising the provision of:

means for operating said indexing means to a predetermined initial indexing position in response to a predetermined sequence of variations of water pressure supplied to said valve from a source thereof; and

dwell means operable independently of variations of water pressure in said system for automatically defeating the

continued advancement of said indexing means after it has undergone its operating sequence to provide a dwell mode for the indexing means in said initial indexing position



while continued pressure variations of the same magnitude may occur in the water pressure supplied to said valve.

4,407,452

APPARATUS FOR MIXING GASES IN MOLECULAR LASERS

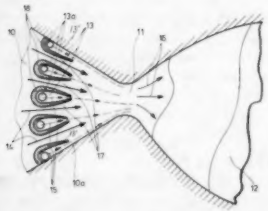
Gunthard Born, and Konrad Altmann, both of Munich, Fed. Rep. of Germany, assignors to Messerschmitt Boelkow Blohm Gesellschaft mit Beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Feb. 13, 1981, Ser. No. 234,260

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008425

Int. Cl.[3] B05B *15/00, 17/00*

U.S. Cl. 239—132.5 9 Claims



1. An apparatus for mixing gases in a molecular laser, comprising nozzle means having a nozzle neck (11) through which a hot laser gas may flow, said nozzle means further comprising a first volume (10) upstream of said nozzle neck (11) and a second volume (12) downstream of said nozzle neck (11), and slot means (13) positioned in said first volume (10) of said nozzle means upstream of said nozzle neck (11) for introducing a cold gas through said slot means (13) into said hot laser gas, and wherein said slot means (13) are sufficiently spaced upstream of said nozzle neck (11), so that mixing of the cold gas with the hot gas takes place substantially in said nozzle neck (11).

4,407,453

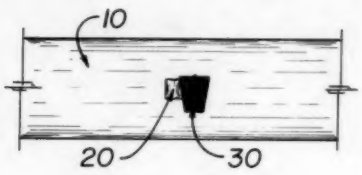
DIFFUSION APPARATUS FOR GATED IRRIGATION PIPES

Gary C. McClellan, Rte. #2, P.O. Box 3255, Vale, Oreg. 97918

Filed Oct. 26, 1981, Ser. No. 314,996

Int. Cl.[3] A01G *25/00*

U.S. Cl. 239—145 13 Claims



1. Water diffusion apparatus for irrigation pipe comprising:

water metering means connected to said pipe for controlling water flow therefrom;

a water diffuser including a framework, substantially inverted U-shaped in cross section, and having a top member and a pair of oppositely disposed downwardly depending side members and one or more water diffusing elements supported by said framework to define a vertically oriented water porous cover;

water diffuser attachment means for attaching said water diffuser to said metering means.

4,407,454

SPRAY SYSTEM

Billy G. Massey, House Springs, Mo., assignor to Whitmire Research Laboratories, Inc., St. Louis, Mo.

Filed Jun. 26, 1981, Ser. No. 277,996

Int. Cl.[3] B05B *9/08*

U.S. Cl. 239—154 16 Claims

1. A spraying system for use in conveniently delivering a fluid such as an insecticide or the like and facilitating the spray applicator's usage by segregating the bulkier fluid reservoir from its more manipulative spray applicator comprising a reservoir for holding a quantity of pressurized insecticide or the like and having a discharge port therein, a clamp means secured upon the upper end of the said reservoir, a valve means incorporating an outlet connecting upon said reservoir and capable of closing off the transfer of insecticide from the same or opening for delivering insecticide from the said reservoir, a length of hose, spray means, said hose connecting said reservoir and operative valve means and with the said spray means, said spray means including a portable sprayer body, a spray actuator, said sprayer body including a cylinder chamber providing a supplemental pocket for collection of pressurized insecticide for charging of its spray means and for assuring a uniform delivery of insecticide to said spray actuator, said spray actuator provided upon said body and when actuated

providing for a delivery of insecticide to its intended location provided the said valve means has been opened.

4,407,455

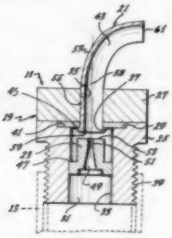
SNAP-IN ROTATABLE SPRINKLER

Ronald J. Sargent, Los Angeles, Calif., assignor to RIS Irrigation Systems, El Cajon, Calif.

Filed Apr. 16, 1982, Ser. No. 369,033

Int. Cl.³ B05B 3/04

U.S. Cl. 239—222.17 **6 Claims**



1. A rotatable sprinkler comprising:

a body having a passage extending therethrough and a shoulder in said passage, said body being connectable to a source of water under pressure;

a sprinkler head of plastic material, one portion of said sprinkler head being rotatably received in said passage to mount the sprinkler head for rotation relative to said body and another portion of the sprinkler head projecting from the body;

said one portion of said sprinkler head having a retainer thereon engageable with said shoulder and forming a snap-fit therewith to retain said one portion of the sprinkler head against withdrawal from the passage in at least one direction without preventing rotation of the sprinkler head relative to said body;

said sprinkler head having passage means extending therethrough communicating with the passage in said body;

means defining a restricted orifice in said passage in said housing for directing water at relatively high velocity into and through said passage means of said sprinkler head;

said passage means being configured so that the sprinkler head is rotated relative to said body by the flow of water in the passage means of the sprinkler head; and

said passage means of said sprinkler head discharges the water flowing through the passage means in a generally circular pattern and said sprinkler provides an obstruction-free path to said circular pattern whereby the circular pattern is not interrupted by the sprinkler.

4,407,456

MIXING NOZZLE

Hugh O. Daniel, deceased, late of Oakland, Calif., by Lucille W. Daniel, administratrix, 532 Lewis St., San Leandro, Calif. 94577

Filed Mar. 27, 1981, Ser. No. 248,314

Int. Cl.³ B05B 7/04

U.S. Cl. 239—423 **1 Claim**

1. Apparatus for producing a small cross-section liquid stream from a liquid source and adapted for mixing a second material with said liquid stream comprising:

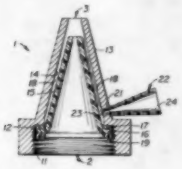
a nozzle member having means at one end of connection to said liquid source and means at a second end for forming said small cross-section liquid stream;

said nozzle member having a truncated cone shape portion narrowing in cross-section toward said second end and having an internal shoulder near said one end;

an inner channel member positioned within said nozzle member, said channel having an annular outwardly extending flange;

said flange of said channel member and said shoulder of said nozzle member cooperating to position said channel within said nozzle member so as to provide an annular space between the interior of said nozzle member truncated cone shape portion and the exterior of said channel;

said flange of said channel member including means to positively position said channel within said nozzle member to establish said annular space between said channel and said cone shaped portion;



said flange of said channel member being eccentric to said channel to accomplish said positive positioning of said channel within said cone shaped portion; and

a cut out portion through said cone shaped portion to establish a passageway to said annular space between said channel and said cone shaped portion;

said nozzle member, channel and passageway being so constructed and arranged that materials introduced through said passageway are mixed said liquid stream passing through said nozzle.

4,407,457

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

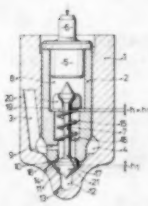
Kurt Seifert, Esslingen-Zollberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 326,091

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048304

Int. Cl.³ F02M 61/00

U.S. Cl. 239—533.12 **7 Claims**



1. A fuel injection nozzle for internal combustion engines having a nozzle body, a valve needle in said nozzle body subjected to a closing force and arranged to open counter to fuel flow direction, said valve needle encompassing an auxiliary needle in an elongated chamber in said valve needle, said auxiliary needle extending from said chamber into a blind bore at a fuel injection end of said nozzle body, said nozzle body having fuel injection areas, each of said areas having at least one injection opening controllable in accordance with valve needle stroke, said valve needle arranged to control a passage from a pressure chamber of said injection nozzle to the injection areas, characterized in that said auxiliary needle is urged in an opening direction of said valve needle by a spring and is displaced in fuel flow direction at a first, lower fuel pressure

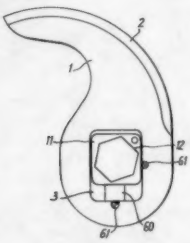
whereby said injection areas are hydraulically separated from one another with fuel flow being interrupted to one of said areas, and further that said auxiliary needle is carried along as a drag member by said valve needle at a second, higher pressure and thereby reestablishes communication between said injection areas.

4,407,458

DEVICE FOR MOUNTING AND BALANCING THE ROTARY KNIVES OF A CUTTER MACHINE

Eric R. Hotimsky, 24, allee des chalets, 93320 Les Pavillons Sous Bois, France

Filed Nov. 16, 1981, Ser. No. 321,635
Claims priority, application France, Nov. 17, 1980, 80 24374
Int. Cl.³ B02C *18/16*
U.S. Cl. 241—282.1 6 Claims



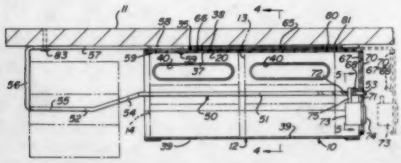
1. A mounting and balancing device for rotary knives of a cutter machine, wherein the machine has a shaft of a predetermined cross-sectional shape, each of the knives including a massive central portion formed with an opening of substantially rectangular shape, a support washer including a boss of square shape for introduction into each of said knife openings, said support-washer being formed with an opening the shape of which is identical to that of the shaft of the machine, said boss including an eccentric hole, a stabilizer holding washer having a sleeve and a finger for cooperating with said eccentric hole, and a single balancing washer of circular shape having in its center a non-circular opening for mounting said balancing washer on said sleeve to thereby offset any unbalance of the knives mounted on the shaft of the machine.

4,407,459

TOILET PAPER STORAGE DISPENSER

Thaddaues H. Wormly, 1218-20 Liberty St., Camden, N.J. 08104

Continuation-in-part of Ser. No. 204,217, Nov. 5, 1980, Pat. No. 4,322,042. This application Oct. 2, 1981, Ser. No. 307,656
Int. Cl.³ B65H *19/00*
U.S. Cl. 242—55.53 12 Claims



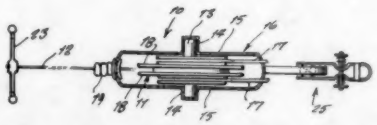
1. A toilet paper storage dispenser comprising an open ended enclosure having elongate front, back and side walls; the ends of said enclosure being open and defining inlet and outlet ends for respectively receiving and delivering toilet paper rolls; said back wall being adapted for attachment to an upright supporting surface; an elongate toilet paper roll guide disposed longitudinally of and centrally within said enclosure having an outlet end region extending through and beyond the outlet end of said enclosure for extension through toilet paper rolls passing through storage positions in said enclosure to a dispensing position beyond said enclosure outlet end; a lateral extension on the outlet end region of said guide extending toward and secured to said back wall; an inlet end wall extending across the inlet end of said enclosure; slide means slidable relative to said back wall and mounting said inlet end wall for shifting movement away from and toward said enclosure between open and closed positions respectively affording and denying access to the inlet enclosure end; and releasable interfitting means on said inlet end wall and inlet end region of said roll guide movable into and out of interfitting engagement upon closing and opening of said inlet end wall, to effect restraint against movement of said roll guide.

4,407,460

AUTOMATIC TOW ROPE REWINDER

Vreij Khudaverdian, c/o ADNOC P.O. Box 7181, Abu Dhabi U.A.E., Saudi Arabia

Filed Mar. 23, 1981, Ser. No. 246,307
Int. Cl.³ B65H *75/40, 75/48*
U.S. Cl. 242—86.5 A 1 Claim



1. An automatic tow rope rewinder, comprising, in combination, a reel inside a case, a tow rope wound around said reel, one end of said tow rope being secured to said reel while an opposite end thereof extends outwardly of said case and is attached to handle bar for being held in a hand of a skier, whereby the skier can separate from the tow rope by releasing the handle bar, two rewind springs between said case and said reel; a drain hole at the bottom of said case, and a resilient fitting mounted in a hole of said case through which said tow rope is pulled, said fitting having a plurality of circular scraper edges therewithin for scraping snow or water from said tow rope; and said case having an extended tab having a hole therethrough, a safety clamp securable to a towing vehicle having a pair of rounded jaws extending into opposite sides of said tab having a hole, and spring means urging said jaws together, whereby said tab will automatically separate from said jaws if excessive force is applied to said tow rope to thereby separate the entire rewinder from the towing vehicle.

4,407,461

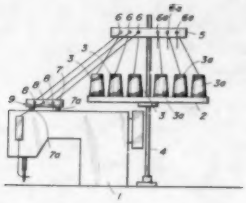
SPOOL HOLDING DEVICE

Susumu Tomisawa, 4-41-42 Maekawa-cho, Kawaguchi-shi, Saitama-Ken, Japan

Filed Feb. 24, 1982, Ser. No. 351,891
Claims priority, application Japan, Mar. 23, 1981, 56-41061[U]
Int. Cl.³ B65H *49/18*
U.S. Cl. 242—134 5 Claims

1. A spool holding device for a sewing machine comprising a spool holder base positioned above a rear portion of said sewing machine and supporting a plurality of spaced upper thread spools on one half portion and a plurality of spaced lower thread spools on the other half portion of said spool holder base, respectively, a first thread guide plate positioned above and extending in parallel to said spool holder base, said first thread guide plate being provided in one half portion of the plate with a plurality of spaced upper thread guide holes and in the other half portion of the plate with a plurality of spaced lower thread guide holes, a second thread guide plate supported on the top of the arm of said sewing machine and extending in parallel to said arm, said second thread guide plate being provided with a plurality of upper thread guide holes,

and a thread retaining means associated with said second thread guide plate for retaining the thread payed out of one selected upper thread spool in cooperation with the second thread guide plate, whereby the leading end of the threads payed out of the respective upper thread spools are passed



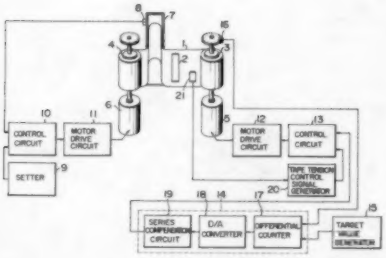
through the respectively associated upper thread guide holes in the first and second thread guide plates and positioned above said arm of the sewing machine and the leading ends of the threads payed out of said lower thread spools are passed through the respectively associated lower thread guide holes in said first thread guide plate to dangle from the guide plate.

4,407,462

WEB DRIVE APPARATUS

Fujio Tajima, Shimoinayoshi; Atsushi Ichikawa, Tsuchiura, and Isao Shimizu, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,143
Claims priority, application Japan, Aug. 15, 1980, 55/111699
Int. Cl.³ G11B *15/06, 23/12;* **B65H** *23/20*
U.S. Cl. 242—184 **10 Claims**



1. In a web drive apparatus wherein a web is wound around a web supply reel and a web take-up reel each driven and rotated by a separate motor, and information is written into or read out of the web by means of an information exchange station disposed between the reels, the improvement which comprises:

web tension control signal generator means for generating a web tension control signal on the basis of variations in the tension of the web between said supply and take-up reels when said web is subjected to intermittent movement;

position control means for producing a position control signal to be used for positioning said take-up reel;

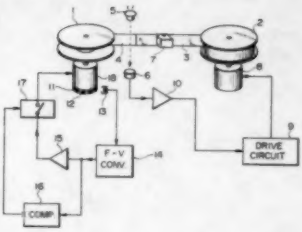
control means for correcting said position control signal in accordance with said web tension control signal so as to cancel transient vibrations of the web, and including means for applying the corrected position control signal to said web take-up reel motor.

4,407,463

TAPE RECORDING REPRODUCING APPARATUS HAVING IMPROVED FAST FORWARD DRIVE SYSTEM

Kazutaka Ashida, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 21, 1981, Ser. No. 295,001
Claims priority, application Japan, Aug. 22, 1980, 55-115376
Int. Cl.³ G11B *15/32, 15/46*
U.S. Cl. 242—201 **16 Claims**



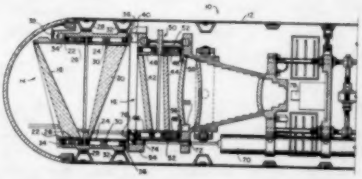
13. Apparatus for controlling the speed of motor means driving a tape between first and second reels, so the motor means speed is maintained relatively constant when the tape is driven at high speed relative to normal speed of the tape, the motor means including first and second motors for respectively driving the first and second reels, the first motor when driving the tape toward the first reel at high speed causing a torque to be produced in the second motor, the control apparatus comprising means for detecting the speed of the second motor, and means responsive to the detecting means for supplying a signal having a component proportional to the second motor speed to the second motor only in response to the second motor speed exceeding a predetermined value associated with the high tape speed, the signal having a component proportional to the second motor speed as supplied to the second motor producing a torque in the second motor opposite to the torque produced in the second motor by the first motor driving the tape at high speed.

4,407,464

STEERING MECHANISM FOR A THERMAL IMAGING SYSTEM AND RANGEFINDER THEREFOR

James Linick, 4611 San Miguel, Tampa, Fla. 33609

Filed Jul. 27, 1981, Ser. No. 286,767
Int. Cl.³ F41G *7/26*
U.S. Cl. 244—3.13 **9 Claims**



1. An imaging system, comprising in combination:

an imaging subsystem operable to scan object space within a predetermined field of view; and

a steering subsystem serially positioned in front of the input of said imaging subsystem, said steering subsystem being operable to scan object space within a variable field of regard within a field of search and including

a first prism,

a second prism positioned rearwardly of said first prism,

first means for rotating said first prism, and

second means for rotating said second prism,

whereby said field of view of said imaging subsystem is effectively increased to equal said variable field of regard within said field of search of said steering subsystem.

4,407,465

METHOD FOR GUIDING MISSILES

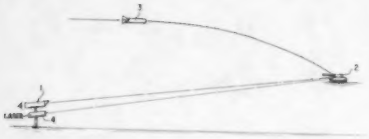
Klaus Meyerhoff, Hamburg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1980, Ser. No. 208,780

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947492

Int. Cl.³ F41G 7/22

U.S. Cl. 244—3.16 7 Claims



1. In a method for guiding a missile by illuminating the target by means of a laser and tracking the target with a sensor system carried by the missile, the improvement wherein said step of illuminating is carried out to illuminate the target by means of the laser for a short period of time and to terminate the illumination of the target after the short period of time and before the missile reaches the target, and said step of tracking is carried out with the aid of an electronic optical sensor by causing the sensor to sense the laser light reflected from the target and then locking the sensor onto the target region from which such reflection took place.

4,407,466

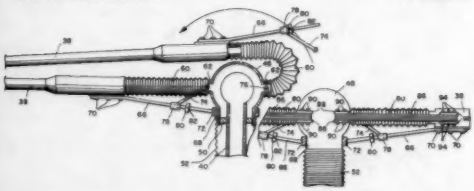
JET NOZZLE ROTARY WING AIRCRAFT

Darrow Thompson, Playa del Rey, Calif., and Daniel L. Thompson, Riyadh, Saudi Arabia, assignors to Overseas International Distributors Company B.V., Geneva, Switzerland

Filed Jul. 14, 1980, Ser. No. 167,813

Int. Cl.³ B64C 27/39, 27/18

U.S. Cl. 244—17.11 6 Claims



1. In a rotary wing aircraft which includes a fuselage, air compressor means on said fuselage, a jet nozzle driven rotor assembly situated over said fuselage and having a rotor axis about which said assembly rotates, said rotor assembly including a generally hollow rotor hub and a plurality of generally hollow jet nozzle driven rotor blades extending radially outwardly of said rotor hub, said rotor hub defining air conduit means to said rotor blades, and means for folding at least one of said rotor blades in a radial plane relative to said rotor hub, said folding means including a section of said rotor blade comprising flexible air conduit means, releasable stabilizing means between said rotor hub and an outboard portion of said rotor blade beyond said flexible air conduit section, and releasable brace means between said rotor hub and said releasable stabilizing means, said releasable brace means being releasably connected to said releasable stabilizing means for sliding movement intermediate the ends of said releasable stabilizing means for preventing the rotor blades from coning beyond a predetermined limit whereby said releasable stabilizing means and said releasable brace means may be released from one another and said rotor blade may be folded in said radial plane with said flexible air conduit section acting as a hinge means.

6. In a rotary wing aircraft which includes a fuselage, a rotor assembly situated over said fuselage and having a rotor axis about which said assembly rotates, said rotor assembly including a rotor hub and a plurality of rotor blades extending radially outwardly of said rotor hub and a pivotal connection between said rotor and said hub for pivotal movement of said rotor in a radial plane releasable stabilizing means between said rotor hub and an portion of said rotor blade outboard of said pivotal connection, releasable brace means between said rotor hub and said releasable stabilizing means, said releasable brace means being connected to said releasable stabilizing means for sliding movement intermediate the end of said releasable stabilizing means, and stop limit means on said releasable stabilizing means for limiting the sliding movement of said brace means in at least one direction along said releasable stabilizing means for preventing the rotor blades from coning beyond a predetermined limit.

4,407,467

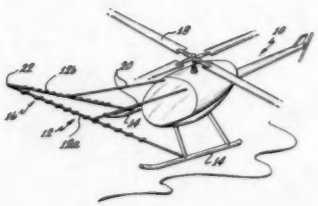
TACTICAL WIRE-CUTTER SYSTEM FOR HELICOPTERS

Charles F. Emigh, Malibu, and Morris Goldin, Orange, both of Calif., assignors to Hughes Helicopters, Inc., Culver City, Calif.

Filed Aug. 24, 1981, Ser. No. 295,695

Int. Cl.³ B64D 7/00; B64C 27/04; F41H 13/00

U.S. Cl. 244—17.11 10 Claims



1. An apparatus for cutting suspended cable for use in combination with a helicopter characterized by having a rotor disc area comprising:

a probe coupled to and extending forward of said helicopter and inclined with respect to the forward motion of said helicopter; and

a plurality of explosive cutting means sequentially disposed along said probe for cutting said cable when in contact with any one of said plurality of explosive cutting means, each one of said plurality of cutting means having all portions projecting therefrom removed by detonation from the patch of travel of said cable along said probe after being detonated to permit continued travel of said cable to an adjacent one of said plurality of cutting means should said cable remain unsevered,

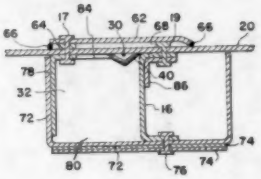
whereby successive encounters between said cable and one of said cutting means is insured until said cable is severed.

4,407,468

EXPLOSIVELY ACTIVATED EGRESS AREA

Laurence J. Bement, Newport News, and James W. Bailey, Tabb, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 30, 1981, Ser. No. 259,209
Int. Cl.³ F42B *1/00*; B64C *1/32*
U.S. Cl. 244—137 P **17 Claims**



1. A mechanism using pyrotechnics to cut an egress area within an existing structure which separates an interior and exterior region comprising:

a structure means for separating exterior and interior regions;

said structure means having a periphery to an egress area and includes a skin attached to frame structural support members;

explosive charge means held against said structure means for cutting said structure means along said periphery;

said explosive charge means being flexible linear-shaped charges;

said flexible linear-shaped charges passing through and around said structural supporting members for cutting said skin and structural supporting members along said periphery;

reaction surface means attached to the exterior surface of said structure means for receiving explosive forces from said explosive charge means, and limiting deformation of said structure means; and

said explosive charge mena and said reaction surface means are arranged and constructed to cut smooth edges along said periphery, and jettison that portion of said structure means within said periphery when said explosive charge means are initiated.

4,407,469

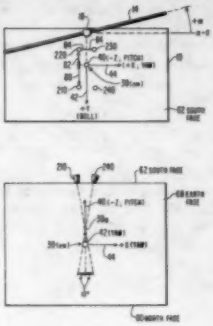
ATTITUDE CONTROL SYSTEM FOR SPACECRAFT UTILIZING THE THRUSTER PLUME

Stephen M. Fox, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 68,502, Aug. 22, 1979, abandoned. This application Mar. 31, 1981, Ser. No. 249,607
Int. Cl.³ B64G *1/26*
U.S. Cl. 244—169 **5 Claims**

1. An attitude control system for a spacecraft of the type having jet type thrusters for orbit adjustment and attitude control maneuvers, a structure having a surface disposed in the thruster exhaust plume of at least one of said thrusters so that said one thruster exhaust plume impinges on said structure to develop a plume torque in a given direction with respect to one of the spacecraft's three primary control axes, hereinafter termed said one axis, to rotate said spacecraft in said given direction about said one axis and so that said one thruster generates a reaction force to develop a control torque about said one axis and a control system for operating said thruster to control the attitude about said one axis or to change the orbit position of said spacecraft, comprising:

said one thruster being spaced from the said structure and canted relative to a second of said spacecraft primary axes orthogonal to said one axis, hereinafter termed said second axis, to direct its reaction line of thrust to cross said second axis at said one axis or on the thruster side of said one axis to develop said control torque in only said given direction about said one axis, when said line of thrust does not pass



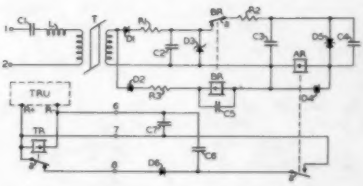
through said one axis, such that the resultant torque about said one axis is caused by said control torque aiding said plume torque.

4,407,470

CODE RESET APPARATUS FOR RAILROAD TRACK CIRCUITS

Heinz Gilcher, Export, Pa., assignor to American Standard Inc., Swissvale, Pa.

Filed Aug. 21, 1981, Ser. No. 295,197
Int. Cl.³ B61C *21/06*
U.S. Cl. 246—34 R **5 Claims**



1. Code reset apparatus for an alternating current track circuit for a railroad track section normally supplied with steady energy but at times selectively supplied with coded energy from an alternating current source coupled to the section rails at the exit end, said track circuit including a track relay means with high output impedance coupled to said rails and to said source and normally responsive only to steady energy to register an unoccupied section, comprising,

(a) a code following relay coupled to said source and responsive to coded energy for periodically closing a contact at the received code rate,

(b) a timing means coupled to said source for storing coded energy to measure a predetermined time period,

(c) a switching means coupled to said timing means by said code following relay only during coded energy off-periods and responsive to the energy stored in said timing means only when a preselected level is exceeded for closing a contact, and

(d) a storage means coupled to said track relay means for

storing its coded energy output when the section is unoccupied during said timing period,

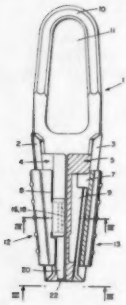
(e) said storage means controlled by said switching means for supplying the stored energy, when said switching means contact is closed, to actuate a response by said track relay means to said coded energy for resetting said source to supply steady energy to said track circuit.

4,407,471

CLAMPING DEVICE FOR SELF-SUPPORTING ELECTRIC CABLES

Hans-Peter Wilmsmann, and Fritz E. Koch, both of Schalksmuhle, Fed. Rep. of Germany, assignors to Dr. Franz & Rutenbeck, Schalksmuhle, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,490
Int. Cl.³ F16L *3/00*
U.S. Cl. 248—63 6 Claims



1. A support for electric cables comprising

(a) a support member having an aperture allowing the support member to be suspended;

(b) a pair of lateral flanges on said support member which include acute angles with said support member and converge in such a way that their spacing is largest adjacent said aperture and smallest remote from said aperture;

(c) a pair of cable-clamping members each having an outer surface which is wedge-shaped and slidable engages the inner surface of one of said pair of flanges and an inner curved surface adapted to exert a clamping pressure upon an electric cable;

(d) a pair of outer clamping members each engaging the outer surface of one of said pair of flanges and each slidable along one of said pair of flanges;

(e) first cooperating tie means on each of said pair of cable-clamping members and on each of said pair of outer clamping members for causing each of said pair of cable-clamping members to move jointly with one of said pair of outer clamping members along one of said pair of lateral flanges;

(f) second cooperating tie means on the rear of said pair of outer clamping members allowing to alter the spacing between said pair of outer clamping members; and

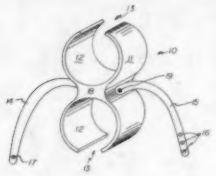
(g) a pair of projections formed by said lateral flanges of said support member of which each engages a cooperating elongated lateral recess in one of said pair of cable-clamping members, thus forming a pair of cooperating abutments with the walls of said recess that directly limit the maximal and the minimal separation of said pair of cable-clamping members.

4,407,472

HOSE HANDLER-KEEPER

Donald R. Beck, P.O. Box 178, Fort Jones, Calif. 96032

Filed Nov. 13, 1979, Ser. No. 93,588
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—89 3 Claims



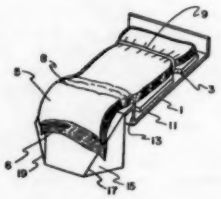
1. A hose handler-keeper comprising a symetrically formed coextensive upper and lower retaining clamp having diametrically opposed permanently open areas for reception therein of hose segments, and clamps joinded together by an integral intermediate web portion defining said symmetry and strap means adapted to affix further hose segments thereto and to hang said keeper on a retention device, said strap means comprises a pair of flexible strap elements disposed on opposed faces of said web, said strap elements having free ends provided with interlocking means on extremities remote from said web.

4,407,473

BAG DISPENSER

Milton A. Howe, Jr., Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 54,219, Jul. 2, 1979, Pat. No. 4,280,811.
This application Apr. 13, 1981, Ser. No. 254,016
Int. Cl.³ B65B *67/12*
U.S. Cl. 248—95 4 Claims



1. Bag dispensing means comprising:

backing board means having a stack of bags retained thereon;

backing board receiving means comprising a backing board support surface terminating in an upright ledge with said ledge being adapted to abuttingly retain said backing board means;

truncated portion means attached along at least one edge thereof to said upright ledge and comprising truncated surfaces and edges; and

wherein said backing board means is supported by said backing board receiving means and is abuttingly retained by said

upright ledge and the mouths of said stack of bags at least partially overlie the truncated surfaces and edges of said truncated portion means; and

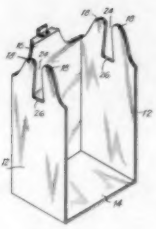
whereby said truncated portion means is adapted to lead a hand toward the mouths of said stack of bags.

4,407,474

PLASTIC SACK HOLDER

Rita Swenson, Ringwood, N.J., assignor to International Paper Company, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 296,946
Int. Cl.³ A63B *55/04*
U.S. Cl. 248—97 **8 Claims**



1. A device to hold open for loading a limp plastic sack having a pair of integral handles and a body portion terminating in a base portion, said device comprising:

(a) a base member;

(b) a pair of side wall members, each attached at its lower end to said base member;

(c) a rear wall member attached to each of said side wall members;

(d) means to engage the handles of said plastic sack, said means comprising a pair of spaced apart ears projecting above the upper edges of each of said side wall members, wherein the space between each of said ears extends downwardly uninterruptedly into each of said side wall members and wherein said space between each of said ears, including said downward extension thereof, is of sufficient width to permit the insertion of several human fingers therein;

wherein the height of said side wall members is slightly less than the height of the plastic sack to be loaded therein and wherein the internal perimeter of said base member is at least equal to the perimeter of the base of said plastic sack when said sack is in an open position and ready for loading.

4,407,475

RECREATIONAL TABLE

John R. Gossage, 7924 Green Moss Glen, Severn, Md. 21144

Filed Feb. 5, 1981, Ser. No. 231,939
Int. Cl.³ A47B *37/04, 3/00*
U.S. Cl. 248—156 **4 Claims**

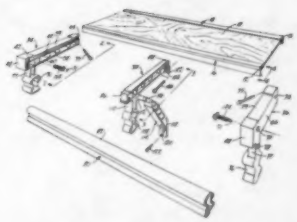
1. A recreational table including a horizontal table top including upper and lower surfaces, remote opposite marginal edge portions and a mount centrally located between said remote edge portions and projecting downwardly from said lower surface, an elongated, telescopically longitudinally extendable and retractable pedestal assembly having one end portion pivotally supported from said mount for angular displacement about an axis transverse to said pedestal assembly and a path extending between said remote edge portions, said pedestal assembly and said top including coacting means operatively associated with each other limiting angular displacement of said top relative to said pedestal assembly to approximately 90° between a first position with said top disposed generally normal to said pedestal assembly and a second position with said top generally paralleling and closely adjacent said pedestal assembly, one of said remote edge portions including handle means and the other of said remote edge portions including a ledge extending therealong and projecting outwardly from said upper surface, said ledge terminating outwardly in an inturned free edge portion projecting inwardly over said upper surface in spaced relation relative thereto, said coacting means including a resilient arcuate slotted sector arm rigidly secured at one end to the lower surface of said top and a laterally outwardly projecting pin carried by said pedestal assembly slidably received in said slot and bearing against the edge of said arm defining one side longitudinal marginal portion of said slot, said edge of said arm having longitudinally spaced notches formed therein in which said pin may be selectively removably seated.

4,407,476

COMBINED SHELF AND CLOTHES BAR ASSEMBLY

Jerry L. Bohannan, Glendora, Calif., assignor to Acme General Corporation, San Dimas, Calif.

Filed Feb. 8, 1982, Ser. No. 346,527
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—235 **18 Claims**



1. A shelf assembly for supporting a flat shelf panel having front and rear edges, comprising:

a pair of elongated edge cleats each having an elongated channel for encompassing one of such edges of the shelf panel and a stiffening flange for extending normal to the shelf panel for stiffening of the shelf, in which the edge cleats have lower flanges extending generally normal to the stiffening flanges;

a pair of outer shelf support brackets each having a socket for receiving an end of a shelf panel and an end of each of the edge cleats encompassing a shelf panel, the socket including means for limiting raising of the shelf panel and means for preventing removal of the edge cleat from the front edge of a shelf panel; and a center support bracket having an upper surface for supporting the underside of the shelf panel and slotted front and rear portions for slidably receiving the lower flanges of the edge cleats so the center support bracket is slidable lengthwise with respect to the shelf along the lower flanges of the edges cleats;

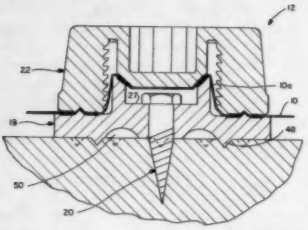
an elongated hanger bar; and

a hanger bar socket integral with each shelf support bracket for encompassing an end portion of the hanger bar.

4,407,477
TIEDOWN FASTENING DEVICE

Jonathan C. Backlund, Palo Alto, and Eugene F. Duval, Woodside, both of Calif., assignors to Fafco, Inc., Menlo Park, Calif.

Filed Aug. 8, 1980, Ser. No. 176,345
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—499 **13 Claims**

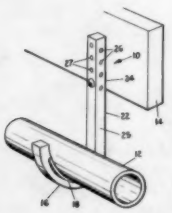


1. A device especially suitable for fastening down one section of a strap, comprising a base member, means for fixedly attaching said base member to a given support structure, and a cap disengageably connected with said base member in a predetermined way, said base member and cap including confronting surface segments cooperating with one another for engaging and retaining said strap section in a fixed position along a path having a plurality of bends when said base member and cap are connected in said predetermined way, at least some of said confronting surface segments including confronting stepped shoulders for gripping said strap segment.

4,407,478
PIPE HANGER

Bonnie E. Hodges, 761 Palmer Dr., Greenville, Mich. 48838

Filed Mar. 6, 1981, Ser. No. 241,373
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—542 **13 Claims**

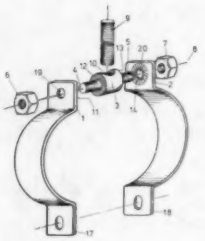


1. A pipe hanger for suspending at least one pipe from a support, said pipe hanger comprising:
an elongate stem for mounting to a support and at least one flexible curved portion connected to said stem;
the at least one flexible curved portion having a radius of curvature defining an arc from the juncture between the stem and the curved portion to an end of the curved portion in excess of 180°;
the end of said curved portion being spaced from the stem a distance less than the diameter of the curved portion and the curved portion being of a shape so that a pipe, having a radius of about the radius of the curved portion, can be securely seated and snap-fit in the curved portion by forcing said pipe downwardly toward the curved portion from a position between the end of the curved portion and the stem;
the elongate stem having a prismatic cross-section with the sides of the stem adapted to be positioned adjacent the support;
the stem having at least two holes located at a selected position on the stem and extending through the prismatic cross-section, with the axis of at least one hole being at an angle relative to the axis of at least one other hole so that the pipe hanger can be nailed at different orientations with respect to the support;
wherein the stem is adapted to mount the at least one pipe to the support at a selected height and angle relative to the support and the curved portion receives the pipe in a snap-fit connection.

4,407,479
PIPE HANGER

Hubert Combe, Lankwitzer Str. 39, 1000 Berlin 42, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,544
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 3044008
Int. Cl.³ F16L *3/00*
U.S. Cl. 248—59 **6 Claims**



1. A pipe hanger comprising,
a pair of oppositely curve legs, joined at one end and having flat contact areas facing each other at the opposite end, the contact areas having inwardly facing, annular, first serrated surfaces defining holes within each annular surface,
a cylindrical member having a central region of larger diameter and at least one end region of narrower diameter, the central region terminating on opposite sides in annular second serrated surfaces for engaging the first serrated surfaces of the contact areas, the end region of narrower diameter passing through a hole in an annular surface and having means for clamping the cylindrical member relative to the contact areas.

4,407,480
TEXTURED BRICK FORM

James E. Trimmer, and Ross W. Worley, both of Kansas City, Mo., assignors to Precise Forms, Inc., Kansas City, Mo.

Filed Jan. 3, 1977, Ser. No. 756,429
Int. Cl.³ E04G *11/08*
U.S. Cl. 249—189 **3 Claims**

1. A construction form including:
a normally upright panel embossed to present a masonry pattern in one face of the panel and an impression of said pattern in the opposite face,
said pattern defining a plurality of offset courses, each having a series of stretchers, presenting a number of vertical joints between the stretchers with the joints in each course vertically misaligned relative to vertical joints in adjacent courses,
said one face having a vertical, marginal border traversing said courses, said border terminating at one lateral edge of said panel,
a number of said series of stretchers extending across said border to said edge,

said border having a plurality of vertically spaced depressions defined by the joints in certain of said courses; and

an elongate, vertical flange rigidly secured to said panel along said border for reinforcing said panel against buckling,

said flange including a longitudinal surface contiguous with

said border and in contact with the stretchers presented therealong, said surface having a plurality of vertically spaced projections disposed to be received within the depressions, whereby said surface contacts substantially the full length of said border to prevent deformation of the latter,

said flange being laterally offset from said one edge.

4,407,481

VALVE ASSEMBLY FOR A PRESSURIZED AEROSOL-DISPENSING CONTAINER

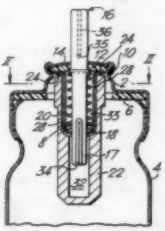
Philip Bolton, Blackburn, and Norman Burdekin, Accrington, both of England, assignors to Neotechnic Engineering Limited, Lancashire, England

Filed May 18, 1981, Ser. No. 264,329

Claims priority, application United Kingdom, May 16, 1980, 8016285

Int. Cl.³ B65D *83/00*

U.S. Cl. 251—353 **8 Claims**



1. A valve assembly comprising a casing member adapted to form a portion of an aerosol container; a first hollow body secured to the inside of the casing member; an elongate valve member sealingly extending through respective apertures in the casing member and the first hollow body for longitudinal inward movement during a dispensing operation, having an outlet passage and an inlet passage at its outer and inner ends respectively, and operative to connect a chamber formed by the spce inside the first hollow body around the valve member with the outside and inside respectively of the container; and a second hollow body encircling the first hollow body and in gripping contact with the external surface of the first hollow body at a plurality of circumferentially spaced regions thereby defining a plurality of liquid retaining capillary channels between the two bodies and between said regions.

4,407,482

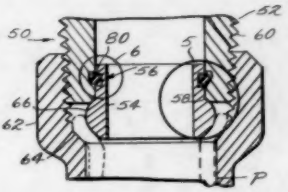
COUPLING JOINT FOR TELESCOPING TUBULAR MEMBERS

Joseph L. Daghe, Decatur, and Robert E. Sands, Shelbyville, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed Nov. 25, 1980, Ser. No. 210,534

Int. Cl.³ F15K *51/00*; F16L *25/00*

U.S. Cl. 251—148 **26 Claims**



24. A coupling joint for telescoping tubular members of a fluid distribution system comprising:

a first tubular member;

a second tubular member having a portion inserted within said first tubular member;

stop means on one of said first tubular member and said second tubular member to limit insertion of said portion of said second tubular member into said first tubular member;

a first annular groove on one of said tubular members and a second annular groove on the other of said tubular members, said first and second annular grooves being arranged to oppose one another when said first and second tubular members are in telescoping relationship;

a resilient O-ring positioned in said first and second annular grooves when the same are opposed to one another for retaining said tubular members in telescoping relationship, said first and second annular grooves, when opposed to each other and when said stop means has limited insertion of said portion of said second tubular member within the end of said first tubular portion, having a cumulative radial dimension anywhere along and normal to a longitudinal axis of the grooves less than the unstressed diameter of a radial section of said resilient O-ring to cause continuous compressive forces to be exerted on said resilient ring by both said first and second annular grooves; and

a camming surface in one of said grooves engaging said resilient O-ring and causing the continuously compressed resilient O-ring to seek to expand and to exert resultant forces on said first and second tubular members urging the same in an axial direction relative one another against said stop means.

4,407,483

BUTTERFLY VALVE

Jean Gachot, 26 bis, avenue de Paris, 95230 Soisy Sous Montmorency, France

Filed Oct. 6, 1981, Ser. No. 309,113

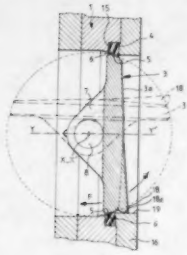
Claims priority, application France, Nov. 19, 1980, 80 24582

Int. Cl.³ F16K *51/00*

U.S. Cl. 251—287 **7 Claims**

1. In a butterfly valve comprising a valve body, a passageway within said body, a butterfly valve closure disk rotatably mounted within said passageway about an axis located at right angles to the axis of the passageway, an annular seal carried by the body and projecting within the interior of said passageway, the valve disk being movable about said axis between an opening position and a closure position in which an annular bearing surface formed at the periphery of the valve disk bears on the seal, the annular bearing surface of the valve disk being a portion of the surface of a sphere the center of which is located substantially at the intersection of the axis of rotation of the valve disk and the axis of the passageway; the improvement in

which the valve disk carries a stop which is so positioned as to be in abutment against an internal surface of the valve other



than said annular seal when the valve disk is in the closure position.

4,407,484

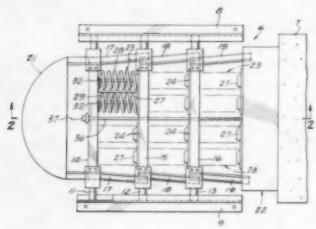
IMPACT ENERGY ABSORBER

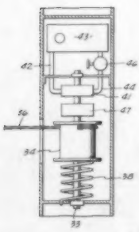
Jan N. Meinzer, Sacramento, Calif., assignor to Meinco Mfg. Co., Sacramento, Calif.

Filed Nov. 16, 1981, Ser. No. 321,339

Int. Cl.³ A01K *3/00*; E01F *15/00*

U.S. Cl. 256—13.1 **9 Claims**





1. An impact attenuating device comprising a stationary housing having an upright wall, a guide rail extending between a location adjacent said upright wall and another location distant from said upright wall, an impact wall, means movably mounting said impact wall on said rail to travel toward and away from said upright wall, a spring flexable between a relaxed condition and an energy storage condition, means mounting said spring in said relaxed condition between said upright wall and said impact wall, means operated by said impact wall upon travel of said impact wall toward said upright wall flexing said spring from said relaxed condition into said energy storage condition, and means controlling flexing of said spring from said energy storage condition into said relaxed condition.

4,407,485

ELECTRIC FENCE STANDARD

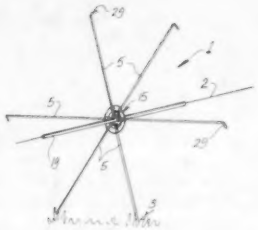
Colin A. Standing, Cambridge, New Zealand, assignor to Gallagher Electronics Limited, Hamilton, New Zealand

Filed Dec. 23, 1981, Ser. No. 333,987

Claims priority, application New Zealand, Dec. 23, 1980, 195922

Int. Cl.³ A01K *3/00*; H05C *1/00*

U.S. Cl. 256—10 **7 Claims**



1. An electric fence standard for supporting a fence wire above a ground surface such that the standard is rotatable about the wire to permit translation of the wire, the electric fence standard comprising, an insulated hub through which the wire passes, a plurality of electrically conductive legs extending radially outwardly from the hub, and a contactor mounted in the hub which make contact with all legs of the fence standard except those in contact with the ground surface at a given time.

4,407,486

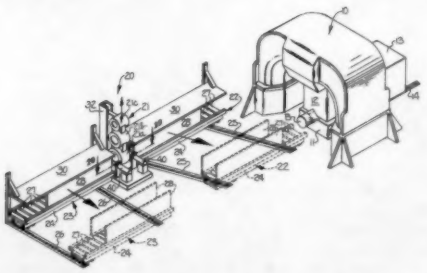
METHOD AND APPARATUS OF HOT WORKING METAL WITH INDUCTION REHEATING

Gary L. Mills, Monroe, and B. Dean Bowen, Matthews, both of N.C., assignors to Teledyne Industries, Inc., Monroe, N.C.

Division of Ser. No. 197,493, Oct. 16, 1980, Pat. No. 4,362,578. This application Aug. 26, 1982, Ser. No. 411,912

Int. Cl.³ C21D *8/00*

U.S. Cl. 266—87 **6 Claims**



1. In an apparatus for hot working a workpiece formed of a metal having an optimum hot working temperature range, said apparatus comprising means for initially heating the workpiece to a temperature within said working temperature range and means for receiving the heated workpiece and for hot working the workpiece by deformation until the workpiece becomes chilled, thereby necessitating reheating prior to further hot working, the combination with said apparatus of an improved means for reheating the chilled workpiece to produce a finer

and more uniform grain structure in the workpiece, said means for reheating comprising an electric induction heating coil having a central opening for receiving the workpiece therethrough, respective elongate support tables positioned on opposite sides of said coil and extending in axial alignment with the central opening in said coil for supporting the workpiece and guiding the same through the coil, said support tables including means for longitudinally moving the workpiece back and forth in a reciprocating manner through said coil, means associated with one of said elongate support tables for moving the support table away from said coil and into close proximity with said means for hot working the workpiece so as to thereby convey the workpiece between said induction coil for reheating and said hot working means for hot working, and power supply means for supplying electric current to said coil at a frequency preselected to concentrate the induced heat in the chilled outer portions of the workpiece to rapidly return the workpiece to a substantially uniform hot working temperature throughout so that continued hot working can be reinitiated before appreciable grain growth can occur.

4,407,487

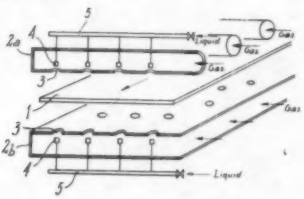
DEVICE FOR COOLING METAL ARTICLES

Robert Wang, Wissous, France, assignor to Heurtey Metallurgie, Paris, France

Division of Ser. No. 112,187, Jan. 15, 1980, Pat. No. 4,329,188. This application Jan. 22, 1982, Ser. No. 341,702

Int. Cl.³ C21D 1/667

U.S. Cl. 266—114 **7 Claims**



1. An apparatus for cooling continuously moving metal articles, said apparatus comprising:

means for projecting conical jets of gas at low pressure toward opposite sides of a continuously moving metal article to be cooled, said projecting means comprising cooling units adapted to be located at opposite sides of the article to be cooled, each said cooling unit having therein a plurality of openings adapted to face the article to be cooled and through which are projected said conical jets of gas; and

means for injecting a conical jet of liquid into each respective said conical jet of gas at a position chosen such that liquid particles of each said jet of liquid are broken into finer particles by friction and are distributed into the entire volume of said respective jet of gas, thereby forming therein a mist which is projected onto the article to be cooled, said injecting means comprising a plurality of liquid injectors, each said injector being positioned within a respective said cooling unit at a position spaced inwardly from and aligned exactly with a respective said opening.

4,407,488

DISTILLATION AND SUBLIMATION APPARATUS COMPRISING A CONDENSER

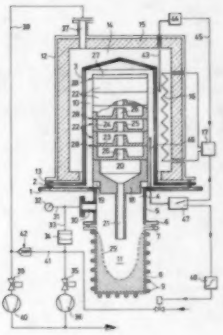
Erwin Wanetzky, Gross-Krotzenburg; Franz Hugo, Aschaffenburg, and Fernand Kuhlmann, Luxemburger Staatsbürger, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,844

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144285

Int. Cl.³ F27D 7/06

U.S. Cl. 266—148 **5 Claims**



1. A distillation and sublimation apparatus comprising: a receiving vessel; a plurality of containers for the starting product, which each have a bottom, an outer wall of constant height and an inner wall of smaller height forming a downwardly directed vapour duct, the containers being mounted one upon the other by their outer walls in such manner that the vapour ducts of all of the containers form a downwardly extending series arrangement and that an unoccupied annular space is present within the receiving vessel; a cover resting on the outer wall of the top container; and a condenser into which the vapour duct of the bottom container discharges, characterized in that capillary gaps (**28**), open towards the annular space (**10**) in the receiving vessel (**3**) are present between the container (**22**) and between the top container and the cover (**27**), and in that the condenser (**8**) communicates with the annular space (**10**) by way of at least one return-flow opening (**19**) for gases, the arrangement being such that the annular space (**10**), the capillary gaps (**28**) the vapour ducts (**26**), the condenser (**8**) and the return-flow opening or openings (**19**) are parts of a closed gas-circulation path.

4,407,489

APPARATUS FOR DISCHARGING HOT FLOWABLE SOLIDS FROM AN UPRIGHT CONTAINER, PARTICULARLY FOR DISCHARGING SPONGE IRON FROM A SHAFT FURNACE

Ernst Oberndorfer, Ried, Austria, assignor to Voest Alpine Aktiengesellschaft, Linz, Australia

Filed Nov. 30, 1982, Ser. No. 445,769

Claims priority, application Austria, Dec. 7, 1981, 5230/81

Int. Cl.³ F27B 1/20

U.S. Cl. 266—191 **5 Claims**

1. In apparatus for discharging hot flowable solids from an upright container having a bottom structure which is adapted to support a column of flowable solids, comprising

a discharge implement which constitutes said bottom structure and is formed with flow passages for conducting a cooling liquid and is operable to effect a discharge of flowable solids from said column, and

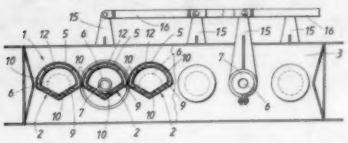
drive means for operating said discharge implement,

the improvement residing in that

said discharge implement consists of a grate having parallel hollow grate bars, which are non-circular in cross-section,

each of said grate bars is mounted for rotation about its longitudinal axis,

said drive means are operable to impart to each of said grate bars rotational oscillations about its longitudinal axis,



each of said grate bars comprises an inner tube defining an inner flow passage and a shell which surrounds and is radially spaced from said inner tube to define an annular flow passage with said inner tube,

each of said grate bars is provided with an inlet fitting for supplying cooling liquid to said inner and annular flow passages and with an outlet fitting for withdrawing cooling liquid from said inner and annular flow passages.

4,407,490

METHOD AND A MEANS FOR INTRODUCING CLOSE-GRAINED CARBONACEOUS FUELS INTO AN IRON MELTING BATH

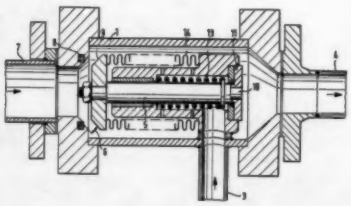
Karl Brotzmann, and Hans-Georg Fassbinder, both of Sulzbach-Rosenberg, Fed. Rep. of Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Fed. Rep. of Germany

Division of Ser. No. 177,162, Aug. 11, 1980. This application Jul. 21, 1981, Ser. No. 285,672

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 293433; Dec. 11, 1979, 2949801

Int. Cl.³ C21B *7/16*

U.S. Cl. 266—266 **6 Claims**



1. A means for introducing close-grained carbonaceous fuels, which are suspended in a carrier gas, and oxygen into an iron melt, comprising a housing, a movable valve member in said housing, a fuel supply pipe for admitting fuel to said housing, an oxygen supply pipe for admitting oxygen to said housing and a tuyere pipe operatively connecting said housing to a tuyere; a fuel aperture and an oxygen aperture in said housing, said movable valve member selectively opening the fuel aperture cross-section or the oxygen aperture cross-section and movement of said movable valve being regulated by the pressure of the oxygen in the supply pipe.

4,407,491

RUBBER BEARING DEVICE HAVING AIR DAMPING CAPACITY

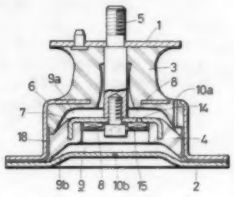
Motoo Kunihiro, Ibaraki; Tomiaki Atsumi; Kazumasa Kuse, both of Toyota, and Masahiro Ishigaki, Ibaraki, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka and Toyoto Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 5, 1981, Ser. No. 308,769

Claims priority, application Japan, Oct. 9, 1980, 55-141193

Int. Cl.³ F16F *15/08*

U.S. Cl. 267—140.1 **9 Claims**



1. A rubber bearing device having air damping capacity which comprises

upper and lower fitments, one of which is adapted to have a vibration-causing device mounted thereon;

a rubber cylindrical body which is interposed between said upper and lower fitments with the upper surface and the lower peripheral surface thereof being bonded firmly and hermetically to said upper and lower fitments, respectively, said cylindrical body defining an air chamber capable of having its volume changed, said chamber being closed by the lower surface of said cylindrical body and said lower fitment;

a rubber piston-shaped body having an upright shaft portion extending through and fitted hermetically in said cylindrical body and bonded firmly and integrally to said upper fitment, said piston-shaped body being disposed within said air chamber thus dividing it into two upper and lower air sub-chambers, orifices communicating with said upper and lower air sub-chambers for releasing air from or for admitting air to said sub-chambers; and

a depression diaphragm member provided in association with said upper and lower sub-chambers, one opening of said depression diaphragm member communicating with one of said sub-chambers and the other opening of which member communicates with the other sub-chamber, said depression diaphragm member being capable of decreasing the magnitude of effective volume change by a definite magnitude.

4,407,492

INTEGRATED SPRING MAT ASSEMBLY FOR SEATING

Stephen E. Muzzell, Ferndale, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

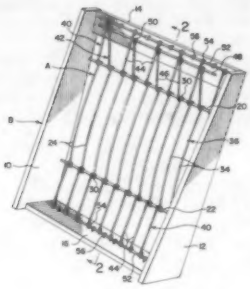
Filed Oct. 16, 1981, Ser. No. 311,914

Int. Cl.³ F16F *3/02*

U.S. Cl. 267—103 **41 Claims**

1. An integrated spring mat assembly for a generally rectangular rigid seat frame having end rails and side rails, said spring mat assembly comprising a relatively widely spaced pair of longitudinal bolster wires, a plurality of relatively closely spaced transverse spring steel stringer wires having intermediate wire portions extending between and connected to said bolster wires to form therewith a generally flat central support portion of said assembly, said stringer wires having extended portions projecting outwardly beyond each of said bolster wires to form edge wing portions on said assembly including a fixed wing portion on each end of said assembly and a free wing portion on at least one end of said assembly, said free

wing portion forming together with the adjacent one of said fixed wing portions a split-wing edge on said assembly, said free wing portion being comprised of the said outwardly projecting portions of selective ones of said stringer wires extending side-by-side from the respective one of said bolster wires to the same one side of and in spaced relation to the adjacent one



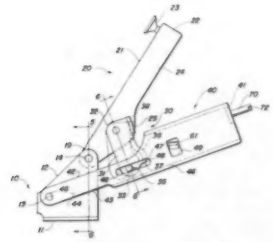
of said fixed wing portions, a longitudinal border wire interconnecting the free outer ends of the said selective stringer wires forming the said free wing portion of said assembly, and the free outer ends of said stringer wires forming the said fixed wing portions of said assembly being provided with fastening means for attaching the assembly to opposed rails of the said seat frame in a position therebetween.

4,407,493

SELF-ADJUSTING TOGGLE CLAMPS FOR FACTORY FIXTURES AND THE LIKE

Raymond A. Okolischan, St. Louis, Mo., assignor to Carr Lane Mfg. Co., St. Louis, Mo.

Filed Aug. 5, 1981, Ser. No. 290,387
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—93 **2 Claims**



1. A toggle clamp adapted to project a force-applying member over, and retract it from, position for clamping workpieces of varying thickness, comprising

(a) a base member having portions supporting two pivots, the first of said pivots being adjacent to the side of the base member at which clamping is to be effected and the second of said pivots being at the opposite side of said base member and at a higher elevation than the first,

(b) a clamp force-applying member having at one end clamp foot means, its opposite end being hingedly pivoted on the second of said base member pivots, and having, intermediate its ends, a toggling pivot,

(c) a link member connected at one end to said toggling pivot and at its opposite end to a slide pivot, and

(d) an actuator member whose length greatly exceeds that of the link member,

said actuator member including longitudinal spaced-apart clevis arms mounted at one end to the first of said base member pivots and extending therefrom for a length sufficient, on angular movement, to clear the base member support portion of the second of its said pivots,

said actuator member having a longitudinal bearing surface providing a slide path relative to which said slide pivot is engaged, said slide path commencing at a point along the actuator member at which the slide pivot is positioned for toggle-clamping an object of a chosen minimum thickness, and extending, from such point, farther from said first base member pivot sufficiently for toggle-clamping an object of greater thickness,

whereby, when the clamp force-applying member is driven against such object of greater thickness for clamping, the slide pivot is driven away from the first base pivot sufficiently to permit the link member to align itself with the actuator member and to toggle, in combination with

(e) locking means mounted on said slide pivot, born by the actuator member and longitudinally slidable relative thereto when released,

(f) the link member having means, adjacent to its connection to said slide pivot, to hold said locking means released except when the link member is in an angular position near alignment with the actuator member,

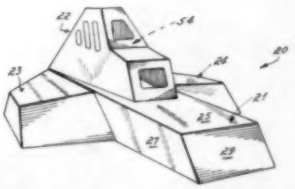
whereby, on withdrawing the force-applying member by angular rotation of the actuator member over and across the base point of the force-applying member, the force-applying member is fully retracted from above such workpiece with the link member substantially perpendicular to the slide path.

4,407,494

TOY AIRCRAFT

David M. Hummel, 722 Miami Ave., Terrace Park, Ohio 45174

Filed Aug. 20, 1981, Ser. No. 294,762
Int. Cl.³ A63G *31/00*
U.S. Cl. 272—1 D **5 Claims**



1. A toy aircraft for a child comprising,

a hollow fuselage,

wings projecting laterally from each side of the fuselage,

and a canopy mounted on top of the fuselage,

said fuselage having a large opening in its lower surface to permit the head and shoulders of a child to be thrust into the fuselage,

said fuselage having an opening in the upper surface thereof communicating with said canopy and through which the child may thrust its head into the space enclosed by the canopy,

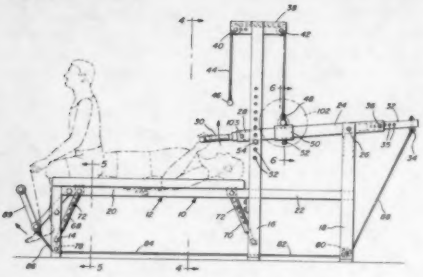
said fuselage having upper and lower walls connected by side walls, and

a V-shaped internal wall disposed adjacent said side walls, the upper portion of said V-shaped internal wall providing a surface for engagement by the forearm of a child to support the aircraft.

4,407,495
MULTI-PURPOSE EXERCISE APPARATUS

Ronald A. Wilson, 1000 Strawberry La., Ashland, Oreg. 97520

Filed Sep. 12, 1980, Ser. No. 186,595
Int. Cl.³ A63B 21/06
U.S. Cl. 272—117 11 Claims

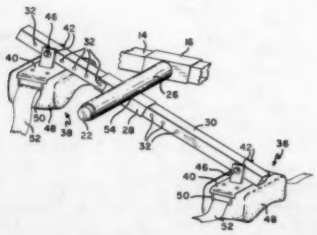


1. An exercise apparatus including a bench having first and second end portions, an elongated support portion spaced horizontally outwardly of and above said one end portion, an elongated generally horizontal lever pivotally supported intermediate its opposite ends from said support portion for oscillation about a horizontal axis transverse to said lever and said bench and with one end portion of said lever projecting toward and overlying said one end portion of said bench, an elongated levertype leg exercise frame pivotally attached at one end to the other end portion of said bench for oscillation relative thereto about an axis transverse to said frame and said bench, the other end of said frame including foot and/or leg engageable abutment means and said one end of said lever including handgrip means, weight means carried by said lever intermediate said handgrip means and the first-mentioned axis, and elongated tension member means extending between and anchored to said other end of said frame and the other end portion of said lever, the opposite end portions of said bench including low tension member guide means with which said tension member means is engaged and upwardly from which the opposite end portions of said tension member means extend toward said frame other end and said lever other end portion.

4,407,496
LIMB EXERCISE DEVICE

David E. Johnson, Apt. 101, 2900 Autumn Dr., Dubuque, Iowa 52001

Filed Dec. 14, 1981, Ser. No. 330,141
Int. Cl.³ A63B 21/06
U.S. Cl. 272—117 9 Claims



1. An exercise device for use in connection with a body joint and limb exercising apparatus which has a movable member to which the apparatus applies a force against movement of the member, said exercise device comprising an elongated member having a distal end and a proximal end, first limb engaging means connected to said elongated member at a point near the distal end of said elongated member and engageable with a limb of a user, second limb engaging means connected to said elongated member at one of a plurality of selected points near the proximal end of said elongated member, said second engaging means being attached to the same limb of a user at a point on the limb spaced from the point of engagement of the first limb engaging means, third means associated with said first and second limb engaging means providing for a releasable attachment of the first and second limb engaging means to the same limb of a user, and connection means along said elongated member providing for varying points of attachment of the movable member to said elongated member at a selected point between the points of attachment of said first and second limb engaging means means with the limb of the user.

4,407,497
WEIGHTED EXERCISE SUIT

Geysa Gracie, P.O. Box A, Alderson, W. Va. 24910

Filed Dec. 29, 1981, Ser. No. 335,359
Int. Cl.³ A63B 21/12
U.S. Cl. 272—119 14 Claims

1. A weighted exercise suit for a human user, comprising:
(a) a body suit means for covering at least the upper portion of the body trunk of the human user;
(b) two weight strip means for adding weight to the upper portion of the body trunk of the human user, said weight strip means being designed to be placed over and removably fastened to selected places on said body suit means, said selected places on said body suit being located over the right and left shoulders of the human user and extending from front to back;
(c) cushion means for cushioning the weight of said weight strips, said cushion means being attached to the lower face of said weight strip; and,
(d) fastening means for removably fastening said weight strip means to said selected places on said body suit means located over the right and left shoulders of the human user and extending from front to back, said fastening means comprising:
(1) a first component attached to the lower face of said cushion means; and,
(2) a second component attached to the upper face of said selected places on said body suit means located over the right and left shoulders of the human user and extending from front to back, whereby said weight strip means may be removably fastened to said selected places on said body suit means located over the right and left shoulders of the user and extending from front to back.

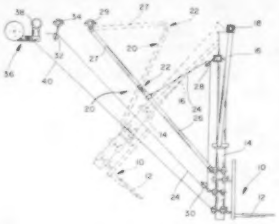
4,407,498
LOCK FOR A FLEXIBLE ELEMENT

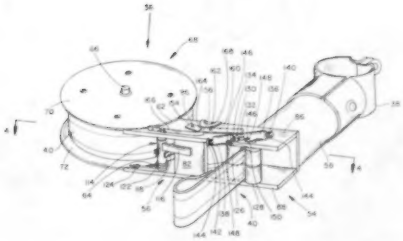
Wayne G. Clore; Charles T. Norton, and William P. Thompson, all of Anderson, Ind., assignors to Recreation Equipment Corp., Anderson, Ind.

Filed Jul. 20, 1977, Ser. No. 817,332
Int. Cl.³ A63B 63/08; B60T 7/12; F16D 59/02
U.S. Cl. 273—1.5 R 1 Claim

1. In combination, a movably mounted backstop and a lock for preventing too-rapid movement of the backstop, the backstop including a flexible safety element, the lock comprising a

frame for providing first and second surfaces, a wedge-shaped jaw supported in the frame for movement between the first and second surfaces and into gripping relation with one of said surfaces, the flexible element passing between said one surface and the movable jaw, means including a spring for yieldably urging the movable jaw between the first and second surfaces and into gripping relation with said one surface to prevent movement of the flexible element between said one surface and movable jaw, means for holding the movable jaw against the urging means out of gripping relation with said one surface, and means for actuating the holding means to release the movable jaw for movement into gripping relation with said one surface, the actuating means including means disposed for rotation in response to flexible element movement, means mounted on the rotating means and responsive to rotation thereof to cause the holding means to release the movable jaw





when the flexible element moves at a rate in excess of a predetermined rate, a spool for storing the flexible element, the spool being rotatably supported on the frame and spring means for exerting rewinding force on the spool, the spring means being wound by rotation of said spool as the flexible element is withdrawn therefrom, a bell crank for retracting the movable jaw from between the first and second surfaces against the yieldable urging means to reset the holding means, the bell crank being pivotally mounted in the frame and supporting the spring, the spring being wound about the bell crank pivot yieldably to urge the bell crank pivotally in one direction, the bell crank including an arm for coupling the spring force to the movable jaw and a resetting arm, force on the resetting arm urging the bell crank about its pivot in a second and opposite direction to withdraw the movable jaw from between the first and second surfaces.

4,407,499

BOWLING AID

Jimmy D. Newton, Midland, Tex., assignor to Thomas L. Taylor, Odessa, Tex.

Filed Jun. 2, 1981, Ser. No. 269,669

Int. Cl.³ A63B *71/02*

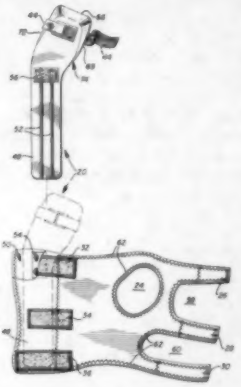
U.S. Cl. 273—54 B **4 Claims**

4. A bowling aid for encapsulating the wrist and hand of a bowler while restraining the second and third fingers of the hand, so that movement of the bowler's wrist, fingers, and forearm is restrained; comprising:

a relatively flexible panel member, a stiffener and finger guide member;

said panel member includes a forward edge portion for contacting the heel and the back of a person's hand, a rear edge portion for contacting the forearm and wrist, and opposed sides adapted to be brought about the hand and fastened together, and a thumb hole; fastener means by which the opposed sides are releasably fastened to one another;

one marginal end of said stiffener and finger guide member includes an elongated tongue member secured to the panel member for imparting stiffness thereinto; the opposed



marginal end of the stiffener and guide member includes means for restraining the second and third fingers of the hand, and includes adjacent cavities within which the knuckles of the second and third fingers are releasably received;

said stiffener and guide member is secured to said panel member by an outwardly opening pocket formed at a location which extends the finger guide member forwardly into a position for receiving the fingers of one's hand; said cavities of said finger guide member extends forwardly in advance of said tongue and panel;

so that when the panel member is fastened about the hand, and the second and third fingers are positioned within the cavities, the relative position of the forearm, wrist, hand, and fingers are maintained at an optimum angle.

4,407,500

RACKET HANDLE

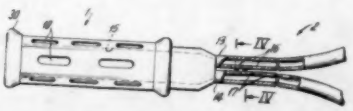
Ulrich Hofmann, Parkstrasse 4, D-8870 Günzburg, Fed. Rep. of Germany

Continuation of Ser. No. 139,453, Apr. 11, 1980, abandoned. This application Jun. 24, 1982, Ser. No. 391,719

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944882

Int. Cl.³ B63B *49/08*

U.S. Cl. 273—75 **9 Claims**



1. A racket of the type used in playing tennis and like sports, comprising an elongated shaft portion, a hollow grip portion having a forward portion and a butt portion with said forward

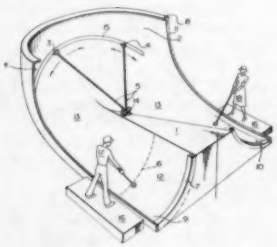
portion being attached to one end of said shaft portion, said one end terminating within and adjacent to said forward portion of said grip, a frame portion connected to the other end of said shaft portion, said shaft portion including two spaced apart hollow tube sections, the space between the portions of said tube sections which face each other in the transverse direction of said tube sections including means for forming a Venturi region for creating a zone of reduced air pressure between said tube sections when the racket is swung, said portions being provided with slots extending generally in the longitudinal direction of said tube sections for allowing said zone of reduced air pressure to communicate with the interior of said tube sections, the interior of said grip portion forming a passageway for communicating air with the interior of said tube sections, said grip portion having a plurality of openings between said passageways and the outer periphery of said grip portion for allowing air to be drawn from the hand of a player using the racket, wherein said openings in said grip portion, said passageway in said grip portion, the interior of said tube sections and said Venturi region are adapted to conduct air therethrough from the hand of the player when the racket is swung, so that perpspiration accumulating on the hand of the player holding said grip portion is removed by the air drawn in said openings through said passageway of said grip portion.

4,407,501

CURVED BALL COURT

Farrell C. Bates, 639 N. Vickers St., Thunder Bay, Ontario, Canada P7C 4B6

Filed Mar. 8, 1982, Ser. No. 355,651
Claims priority, application Canada, Mar. 11, 1981, 372792
Int. Cl.³ A63F *7/02*
U.S. Cl. 273—118 R **5 Claims**



1. A curved ball court having a raised part extending from the front of the court towards the central region of the court, a concave playing surface at each side of the raised part, a vertical curved rear wall, the rear wall and the concave playing surfaces being connected by a parabolic curve.

4,407,502

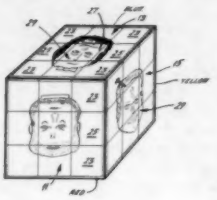
MATRIX PUZZLE GAME

John A. Paulos, 609 Martin La., Dresher, Pa. 19025

Filed Oct. 2, 1981, Ser. No. 307,968
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **10 Claims**

1. A puzzle game comprising:

a three-dimensional matrix cube with exclusively rotatable rows and columns of cube segments, each face of said cube being defined by a plurality of said cube segments, each cube segment on each face having a pictorial design component thereon which complements pictorial design components on adjacent cube segments on each face to form integrated composite invertible pictorial designs on each face in a plurality of rotated locations of rows and columns of said cube



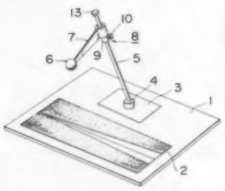
segments, including rotated locations thereof wherein selected cube segments are inverted.

4,407,503

GOLF PRACTICE DEVICE

Hideyuki Nishizawa, 1-5-1, Nakasato-cho, Kita-ku, Tokyo, Japan

Filed Jul. 22, 1981, Ser. No. 285,738
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—197 R **1 Claim**



1. A golf practice device comprising in combination

(a) a base plate,

(b) an inclined support shaft extending upwardly from the base plate,

(c) a rigid golf ball support arm having an inner end that is mounted on said support shaft so that said ball support arm can slide up and down said inclined support shaft,

(d) a golf ball attached to the outer end of the golf ball support arm,

(e) means for supporting the inner end of said ball support arm on said support shaft at a distance such that said support arm is freely rotatable around said support shaft and so that the ball can be positioned between 20 and 40 cm above said base plate,

(f) said support arm being connected to said support shaft at such an angle that gravitational forces alone will always automatically return said golf ball to exactly the same location above said base plate so that a golfer practicing his golf swing can hit the golf ball any desired number of times without either changing his position or removing his hands from the golf club.

4,407,504

AMUSEMENT DEVICE

Richard Popov, Bldg., Apt. 5, 60 North Street, Marcellus, N.Y. 13108

Filed Jul. 22, 1981, Ser. No. 286,031
Int. Cl.³ A63F *9/06*; A63H *3/16*
U.S. Cl. 273—153 R **6 Claims**

1. An amusement device comprising:

housing means having a transparent lid means associated therewith for permitting a viewing into an interior portion of said housing means;

a plurality of latching means operably associated with said

housing means and serving to retain said lid means in a normally latched closed position;

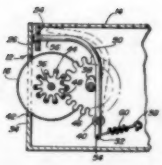
tumbler means selectively positionable to effect an unlatching of said latching means, thereby to effect a release of said lid means whereby said lid means may be moved into an open position so as to permit access to said interior portion of said housing means, said tumbler means being positionable on an exterior surface of said housing means, said tumbler means including a plurality of rotatable tumblers having positioning indicia on external surfaces thereof, whereby a proper positioning of said indicia will effect said unlatching of said lid means;

first gear means fixedly secured to said tumbler means, said first gear means including a plurality of first gears one each of which is respectively associated with one of said plurality of said tumblers, whereby a rotation of a respective one of said plurality of said tumblers will effect a concurrent rotation of a respective associated first gear;

first support shaft means rotatably mounted in said housing means, said first support shaft means having said tumbler means and said first gear means mounted thereon;

second support shaft means rotatably mounted in said housing means;

second gear means fixedly mounted on said second support shaft means, said second gear means including a plurality of second gears each of which is in a respective meshing



driving relationship with one of said first gears, whereby a rotation of a respective one of said first gears will effect a concurrent rotation of a respective one of said second gears;

third support shaft means rotatably mounted in said housing means, said plurality of latching means being rotatably and spring-biasedly mounted on said third support shaft means;

cam means fixedly secured to said second support shaft means, said cam means being rotatable with said second gear means and being in slidable engagement with said latching means, thereby to control a positioning of said latching means with respect to said lid means; and

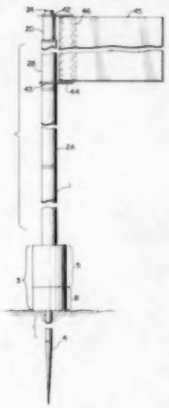
locking means for selectively fixedly securing said first gear means and said tumbler means in a fixed relationship, said locking means including a use of a selectively removable pin in each of said first gears, said removable pin being positionable in aligned apertures respectively contained in each of said first gears and said tumblers, whereby relative rotation between each of said first gears and said tumblers is prevented when said removable pin is in position and relative rotation between each of said first gears and said tumblers is permitted when said removable pin has been selectively removed from said aligned apertures, thereby to permit a selective changing of indicia positioning necessary to effect an unlatching of said lid means by permitting a selective relative rotation between each of said first gear means and said tumblers when desired.

4,407,505

PORTABLE, COLLAPSIBLE PRACTICE GOLF FLAGSTAFF WITH STOWABLE GROUND SPIKE

Edward Kendziorski, 1008 Hukill St., Brilliant, Ohio 43913

Filed Mar. 2, 1982, Ser. No. 353,919
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—177 R **55 Claims**



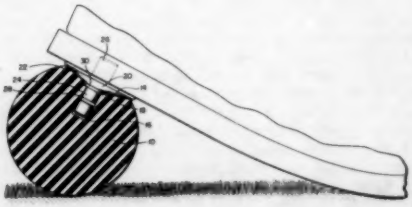
1. A portable, collapsible flagstaff suitable for use to support a practice golf shag flag or putting flag, comprising a segmented tubular, vertically elongated flagstaff having at least an upper, middle and bottom segment, which segments are detachably connected to one another to form the length of the flagstaff; a weighted cylindrical base at the foot of and concentrically mounted on said bottom segment, permanently attached thereto; and a spike for removably anchoring said flagstaff in the ground; said weighted base being adapted either to store in its interior said spike when the flagstaff structure is disassembled for carriage or storage, or to provide mounting means by which said spike can be attached to the bottom of said weighted base for anchoring said flagstaff to the ground when assembled for use.

4,407,506

GOLF TRAINING DEVICE

John P. O'Brien, 175 E. Delaware, Chicago, Ill. 60611

Filed Feb. 22, 1982, Ser. No. 350,999
Int. Cl.³ A63B *69/36*; A43B *5/00*
U.S. Cl. 273—187 B **7 Claims**



1. A golf training device adapted to be removably affixed to a golf shoe, said training device comprising:

a support member, said support member being substantially

spherical with a diameter from 1.6 to 1.75 inches, and having a radially disposed well therein adapted to receive the shank of a golf shoe spike, and

a golf shoe spike comprising a conventially threaded upper portion, a flange of conventional size and shape, and a lower shank portion, said shank portion being generally cylindrical in shape with at least one annular rib disposed thereon, said rib being spaced from said flange,

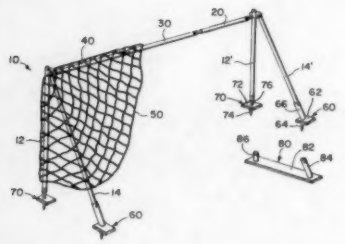
said support member designed to cooperate with said spike and receive said shank portion in said well, said annular rib adapted to frictionally engage the supporting member to removably affix said supporting device to a golf shoe.

4,407,507

PORTABLE SOCCER GOAL

Vincent C. Caruso, 120 Old Country Rd., Melville, N.Y. 11747, and Andrew Caruso, 104 Wyandanch Blvd., Commack, N.Y. 11725

Filed Jul. 6, 1981, Ser. No. 280,327
Int. Cl.³ A63B *63/00*
U.S. Cl. 273—400 **1 Claim**



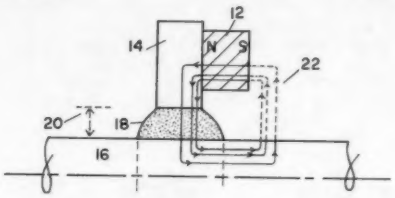
1. A portable soccer goal comprising a first end support means; a second end support means; a cross support means having a first end connectable to said first end support means and a second end connectable to said second end support means; a net supportable by said first and second end support means and said cross support means, wherein each of said first and second end support means comprises a stationary post for positioning upright upon a support base, and an elongated brace member having an upper end pivoted to the upper end of said stationary post, wherein said cross support means comprises a plurality of sleeve extensions, a first one of said sleeve extensions being connected at its first end to said upper end of one of said stationary posts, a second one of said plurality of sleeve extensions having a first end connected to the other of said stationary posts at the upper end thereof, each of said first and second sleeve extensions having a second end for connection to another of said plurality of sleeve extensions, wherein said another of said plurality of sleeve extensions has a first end and a projecting tenon extending axially outwardly therefrom, said projecting tenon having a retractable rounded protuberance and a second end, said second end having a positioning slot for reception therein of a retractable rounded protuberance, said slot extending about the circumference of said sleeve an arcuate distance greater than the width of a retractable rounded protuberance which it receives to allow for the rotation of the stationary posts relative to said another sleeve extension, wherein said second end of said first sleeve extension also has an elongated arcuate slot to receive therein said rounded protuberance of said another sleeve extension, wherein said net comprises a first end attached to one of said stationary posts along the length of said post, and a second end connected to the other of said stationary posts along the length of said post, and a middle portion between said first and second ends thereof extending around said elongated brace members along the length of each brace member, said middle portion of said net contacting said brace members on the side thereof facing away from said stationary posts, whereby a front opening is provided defined between the stationary posts, wherein each said stationary post has at its upper end a knob, said knob extending above the plane of said cross support means, and each said stationary post further having a fin adjacent said upper end, whereby said net may be passed thereover to hold it in place.

4,407,508

SINGLE-POLE-PIECE FERROFLUID SEAL APPARATUS AND EXCLUSION SEAL SYSTEM

Kuldip Raj, Merrimack, and Raoul Casciari, Bedford, both of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Dec. 16, 1982, Ser. No. 450,339
Int. Cl.³ F16J *15/40*
U.S. Cl. 277—1 **13 Claims**



11. A method of providing a ferrofluid exclusion seal about a rotatable shaft element, which method comprises:

(a) surrounding the rotatable shaft with an annular, single pole piece of magnetically permeable material having a one and other end, the one end of the pole piece secured in a magnetic-flux relationship to one end of an annular permanent magnet having a one and other end, the other end of the single pole piece extending into a close, non-contacting relationship with the surface of the shaft to define a small radial gap;

(b) sealing the shaft by employing a ferrofluid in the radial gap, the ferrofluid characterized by a magnetization value in oersteds, and a magnetic-flux density in the radial gap sufficient to provide a magnetic-force density on the ferrofluid which is greater than the centrifugal-force density of the rotatable shaft element on the ferrofluid, to retain the ferrofluid in a seal position; and

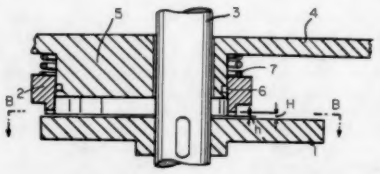
(c) providing a magnetic flux path through the permanent magnet, the single pole piece, the ferrofluid in the radial gap, the shaft, and an air gap between the shaft and the other end of the permanent magnet.

4,407,509

ZERO-LEAKAGE NON-CONTACTING MECHANICAL FACE SEAL FOR ROTARY MACHINES

Izhak Etsion, Haifa, Israel, assignor to Technion Research & Development Foundation Ltd., Haifa, Israel

Filed Jan. 18, 1982, Ser. No. 340,246
Claims priority, application Israel, Mar. 11, 1981, 62344
Int. Cl.³ F16J *15/34, 15/40*
U.S. Cl. 277—3 **9 Claims**



1. A non-contacting end-face seal for a rotary machine, said

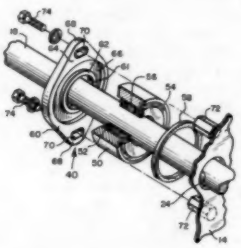
seal comprising a rotor mounted on the shaft of said machine and rotating therewith and a stator connected to the housing of said machine, said rotor and said stator having opposing, smooth and preferably planar surfaces separated by a gap of at least two sizes of width, the seal being characterized by one of the two opposing surfaces being smooth and uniform and the other opposing surface being in the shape of a closed curve having an inside enclosing said shaft and an outside contained within the contours of the opposite surface, said closed curve forming a partition between a zone of higher pressure and a zone of lower pressure and being so formed that a tangent to every point of said curve forms an acute, positive or negative angle with the relative velocity vector passing through that point or coincides therewith and that at all points of said curve where the relative velocity vector is directed from the zone of higher pressure to the zone of lower pressure the width of the gap between said opposing surfaces is smaller than it is at those points where the relative velocity vector is directed from the zone of lower pressure to the zone of higher pressure.

4,407,510

ADJUSTABLE PACKING GLAND ASSEMBLY FOR MOVABLE BLADE DAMPER

Jack M. Cornelius, and Egon V. Braunagel, both of Birmingham, Ala., assignors to Flo-Tech Dampers, Inc., Birmingham, Ala.

Filed Nov. 13, 1981, Ser. No. 320,950
Int. Cl.³ F16J *15/00*
U.S. Cl. 277—12 **12 Claims**



1. In combination with a damper comprising a peripheral frame member, at least one opening defined in the frame member, a damper blade shaft passing through the opening, and a damper blade mounted to the shaft to one side of the frame member, the improvement comprising:

a packing gland assembly comprising:

a packing gland sleeve disposed around the shaft, said packing gland sleeve defining an annular recess positioned adjacent the shaft;

a packing material positioned in the recess between the shaft and the packing gland sleeve; and

means for retaining the packing material in place in the annular recess to create an effective seal between the shaft and the sleeve;

a pressure seal disposed between the packing gland assembly and the frame member around the opening to prevent leakage of gases between the damper frame member and the packing gland assembly;

at least one attachment member fixedly mounted to the frame member adjacent the opening;

at least one hold-down member, included in the packing gland assembly and aligned with the at least one attachment member; and

at least one fastener clamping the hold-down member against the attachment member to releasably and adjustably hold the packing gland assembly in place against the frame;

said attachment member, hold-down member and fastener cooperating to provide a range of lateral adjustability of the position of the packing gland assembly with respect to the frame before the fastener is secured in place, to enhance the concentricity of the packing gland sleeve around the shaft;

said attachment member, hold-down member, and fastener cooperating to rigidly and fixedly secure the packing gland assembly in place on the frame member when the fastener is secured in place;

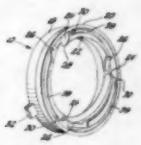
said pressure seal operating to create an effective seal between the frame member and the packing gland throughout the range of lateral adjustability.

4,407,511

SEAL AND SCRAPER ASSEMBLY

Robert L. Benton, Bay City; Dainis O. Martinsons, and Flave F. Stimpson, both of Saginaw, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 24, 1981, Ser. No. 287,245
Int. Cl.³ E21B *33/08*; **F16J** *15/00, 15/16*; **F16K** *41/00*
U.S. Cl. 277—24 **3 Claims**



1. A seal and scraper for a nut and screw actuator comprising; an annular lip member abutting and compressed radially inward by a cylindrical surface on said nut at assembly; a thread sealing portion having a thread form cooperating with the screw thread on the actuator and including a plurality of circumferentially spaced scraper means each defined by a scraper surface extending through the thread form at an angle oblique to a radius of the thread form and terminating at a position radially inward of a normal thread form when the screw actuator is not engaging the screw thread so that the thread sealing portion adjacent the scraper surface must be deflected radially outward during insertion of the screw actuator, web means connecting the lip member with the thread sealing portion along the oblique angle for transfering the force of compression on said lip member to the scraper surface of said thread sealing portion and a lubricant return surface extending in a circumferential direction oblique to the axial direction of the thread form; and means for preventing rotation of said seal and scraper relative to the nut.

4,407,512

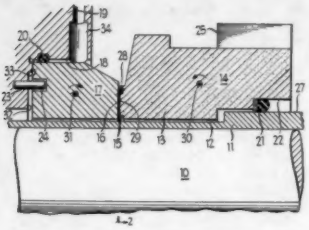
HIGH PRESSURE ROTARY MECHANICAL SEAL

Joseph J. Trytek, Chicago, Ill., assignor to John Crane-Houdaille, Inc., Chicago, Ill.

Continuation of Ser. No. 646,335, Jan. 2, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,328
Int. Cl.³ F16J *15/16, 15/40*
U.S. Cl. 277—96.1 **6 Claims**

1. A rotary end face seal comprising relatively rotatable

primary and seat rings having abutting radially disposed sealing surfaces, a support for the seat ring, means sealing a radially outer periphery of the seat ring with respect to the support, means limiting contact between the seat ring and the support in an axial direction to a radially outer region of the seat ring, the centroid of an axial section taken through a quadrant of the seat ring being located radially inward of the



means limiting contact between the seat ring and support, the proportion which the radial width of the abutting radially disposed sealing surfaces bars to the inner radius of the contacting surfaces is in the range of 0.085 to 0.3, and at least one of said abutting surfaces is relieved radially inwardly from the pressure side of the seal at peripherally spaced intervals to form hydro-pads.

4,407,513

MECHANICAL SEAL

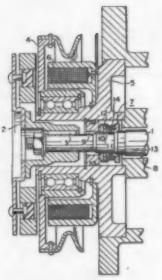
Akira Takenaka, and Tatsuhiko Fukuoka, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Continuation of Ser. No. 123,625, Feb. 22, 1980, abandoned, which is a division of Ser. No. 895,072, Apr. 10, 1978, abandoned. This application Apr. 8, 1982, Ser. No. 366,810

Claims priority, application Japan, Apr. 12, 1977, 52-41838; Mar. 3, 1978, 53-24137; 4138, Mar. 3, 1978, JPX

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—96.1 **9 Claims**



1. A combination comprising:

a mechanical seal including stationary means and a follower ring,

the stationary means including a seating ring which receives therethrough a rotatable shaft and has an annular sliding contact surface,

the follower ring being mounted to rotate with said rotatable shaft and has another annular sliding contact surface in slidable contact with the sliding contact surface of said seating ring when the shaft is rotated causing relative motion in one direction between said sliding contact surfaces,

each said annular sliding contact surface having a radially inner portion and a radially outer portion,

means for sealing a pressurized fluid, which consists of a liquid or a mixture of a gas and a liquid, in a zone radially outside of said follower ring, and

means for connecting the radially inside surface of said follower ring to inside air,

at least one of said annular sliding contact surfaces having means cooperative with the other said annular contact surface for avoiding the leakage of said fluid from said outside zone to said inside air, said leakage avoiding means comprising:

(a) a plurality of grooves in at least one of the annular sliding contact surfaces, said grooves having a closed outer end portion terminating radially short of the outer periphery of said annular sliding contact surface, said grooves having a depth in the range from as low as 0.05 mm up to about 1.0 mm and being less than about 1.0 mm wide, at least some of said grooves having open radially inner ends, said grooves being oriented outwardly from the shaft in a rearward direction with respect to the direction of said relative motion, said grooves extending along a line approximately tangent to the radially inner edge of the corresponding annular sliding contact surface; and

(b) means for avoiding leakage with the follower ring stopped and formed by an annular, axially raised portion disposed along the periphery of at least one of the sliding contact surfaces, said axially raised portion being defined by a slight swelling of the radially outer circumferential portion of said at least one sliding contact surface in the axial direction beyond the radially inner circumferential portion thereof while maintaining a small clearance between inner circumferential portion of the sliding contact surfaces to hold therebetween a fluid, said raised portion increasing the surface pressure at the radially outer circumferential portion of said slide contact surfaces beyond that at the radially inner circumferential portion, the axial extent of said raised portion being several microns or less, the closed outer ends of said grooves leaving a circumferentially continuous annular surface along said raised portion.

4,407,514

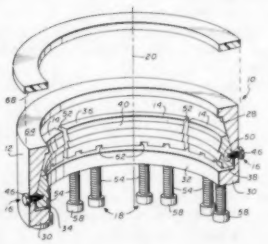
WELLHEAD CASING PACKING SUPPORT

Frederick A. Hausler, Shreveport, La., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,555

Int. Cl.³ F16J *15/06*; E21B *33/12*

U.S. Cl. 277—117 **5 Claims**



1. A device for supporting a set of packing rings mounted in sleeved relationship between a casing and a wellhead bore comprising:

a support ring of generally cylindrical configuration having a central axial bore with an inside diameter greater than the diameter of the casing so that the ring may be sleeved about the casing, the support ring having an upper bore portion defined by an internal frusto-conical surface which is convergent inwardly toward an upper end of the support ring, the support ring having an intermediate bore portion with an inside diameter greater than the inside

diameter of the upper bore portion and a lower bore portion having a depending inwardly extending annular lip defining an upwardly facing shoulder on the top side of the lip;

a plurality of clamping segments of arcuate configuration arranged in a generally circular pattern, each clamping segment having gripping means on its inner arcuate surface and having an external arcuate surface defining a frusto-conical configuration convergent toward the upper end of the clamping segment, the external frusto-conical surfaces having a common conical axis and being defined by a cone angle substantially equal to the cone angle which defines the internal frusto-conical surface of the support ring;

a plurality of releasable retaining means for securing the clamping segments to the inside of the support ring in an unactivated position so that when the support ring is sleeved about the casing the gripping means does not contact the casing, the clamping segments being received retained inside the support ring such that small gaps exist between the adjacent segments; and

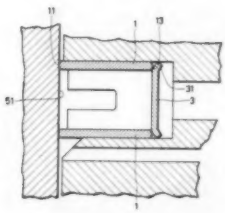
activating means received through the bottom of the inwardly extending annular lip of the support ring for pressing the clamping segments upward upon release of the retaining means so that the coacting frusto-conical surfaces of the segments and support ring act to wedge the clamping segments radially inward allowing the gripping means to contact the casing, the gripping means engaging the casing so that the clamping segments and support ring are secured to the casing.

4,407,515

COMBINED OIL RING

Yoshio Naito, Urawa, Japan, assignor to Nippon Piston Ring Co., Ltd.,, Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,312
Claims priority, application Japan, Jun. 12, 1981, 56-90506
Int. Cl.³ F16J *9/04;* **F16L** *9/06*
U.S. Cl. 277—139 **10 Claims**



1. An oil ring, comprising; a steel spacer expander and a pair of steel side rails, said steel spacer expander comprising a parent material of Austenite matrix structure and having a nitride layer in the surface the thereof; said steel side rails comprising a parent material of Martensite matrix structure, and having a nitride layer formed in the surface thereof.

4,407,516

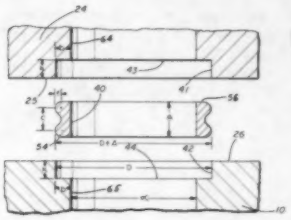
PRESSURE ENERGIZED SEALING CONNECTION WITH ANNULAR SEAL RING

Tri C. Le, and Bruce P. Noble, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,353
Int. Cl.³ F16J *15/06*
U.S. Cl. 277—206 R **9 Claims**

1. A pressure energizable sealing connection for sealing between connected first and second coaxially aligned members which are provided with central bores and are subjectable to high fluid pressures therein, said first and second aligned members being each provided with an internal annular recess at the end thereof which is connected adjacent to the other of said members, each said recess of a given one of said first and second aligned members being defined by an internal cylindrical surface extending from the adjoined end of said one member and terminating at an annular radial shoulder formed by an enlargement of the bore of said one member;

a sealing ring for sealing between said connected coaxially aligned members when positioned in said recesses in coaxial alignment therewith, said sealing ring having an external diameter which exceeds the diameters of said recesses of the coaxially aligned members and upper and lower annular end surfaces which reside in planes transverse to the axis of the sealing ring, said sealing ring having a pair of circumferential projections for sealing with the cylindrical sealing surfaces of the coaxially adjoined members, said circumferential



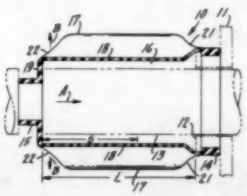
projections being separated by a continuous circumferential groove and each of said projections having an arcuate external surface in radial cross section, said ring having an axial dimension which is slightly less than the sum of the axial dimensions of said internal recesses and an external diameter at its circumferential projections which slightly exceeds the diameter of said internal recesses to provide an interference fit of the sealing ring in said recesses and an initial seal with the axial connected members at very low internal fluid pressures, said ring being pressure energizable by fluid pressure internally of said connected first and second coaxially aligned members and subject to being radially compressed thereby for effecting a bore seal with said first and second coaxially aligned members which increases in sealing effectiveness with increasing internal fluid pressure.

4,407,517

PROTECTIVE BOOT FOR SOLENOID

James U. Neyer, Lake Bluff, Ill., assignor to Synchro-Start Products, Inc., Skokie, Ill.

Filed Dec. 6, 1982, Ser. No. 446,960
Int. Cl.³ F04B *21/00;* **F16J** *15/50*
U.S. Cl. 277—212 FB **7 Claims**



1. A protective boot for a solenoid or like device of the kind comprising a housing having an opening through which a shaft projects, the shaft being reciprocally axially movable through a stroke of given length between an extended position and a retracted position relative to the housing, the boot being of resilient elastomer material and comprising:

a fixed end adapted to be sealed to the housing around the opening through which the shaft extends;

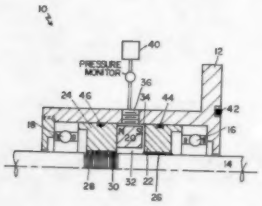
a movable end adapted to be sealed to the shaft;
and a fluid chamber extending between the fixed end and the movable end of the boot in encompassing relation to a portion of the shaft, the fluid chamber having an unstressed axial length exceeding the aforesaid stroke length,
the fluid chamber including a plurality of concave wall portions each extending axially of the shaft, which concave wall portions are forced outwardly of the shaft by the resiliency of the boot during movement of the shaft toward its retracted position, so that the volume of the fluid chamber remains generally constant during reciprocal movements of the shaft.

4,407,518

NONBURSTING MULTIPLE-STAGE FERROFLUID SEAL AND SYSTEM

Ronald Moskowitz; Kuldip Raj, both of Merrimack, and James L. Kern, Nashua, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Filed Jan. 5, 1983, Ser. No. 455,065
Int. Cl.³ F16J *15/40, 15/54*
U.S. Cl. 277—1 **15 Claims**



1. A nonbursting, ferrofluid seal apparatus to provide a ferrofluid seal about a shaft element between a first high-pressure and a second low-pressure environment, which seal apparatus comprises in combination:
(a) a permanent magnet having a one end and another end;
(b) first and second pole pieces, each having a one and another end, the other end of each of the pole pieces in a magnetic-flux relationship with the one end of the permanent magnet, and the other ends of the first and second pole pieces extending into a close, noncontacting relationship with the surface of the shaft element to be sealed, to define a radial gap between the respective other ends of the pole pieces and the surface of the shaft element;
(c) the first pole piece on the high-pressure side of the first high-pressure environment at the other end thereof, or the portion of the surface of the shaft employed therewith adjacent to the other end, having a plurality of ridges thereon, to form with a ferrofluid a plurality of separate, multiple, seal stages beneath the other end of the first pole piece, to provide a defined pressure capacity to the seal apparatus, which pressure capacity is greater than the high pressure of the first high-pressure environment;
(d) the other end of the second pole piece and the surface of the shaft element defining a first-stage radial gap, to form with a ferrofluid, on the low-pressure side of the second environment, a single-stage ferrofluidic seal;
(e) the permanent magnet, the first and second pole pieces and the multiple-stage ferrofluid and the single-stage ferrofluid seals defining a first interstage volume between the single-stage ferrofluid seal and the first stage of the multiple-stage seal;
(f) ferrofluid magnetically retained under the other end of the first and second pole pieces, to provide a multiple-stage pressure-capacity seal under the other end of the first pole piece and a single-stage ferrofluid seal under the other end of the second pole piece;
(g) passageway means extending into the first-stage volume; and
(h) means to remove air from the interstage volume through the passageway means, to maintain the interstage volume at a defined low pressure between the first high- and second low-pressure environments, thereby providing a nonbursting, first-stage ferrofluidic seal in a stable, nonbursting condition.

4,407,519

BOAT TRAILER TONGUE EXTENDER

Gregory L. Heyser, 2881 Forebay Rd., Pollock Pines, Calif. 95726

Filed Oct. 5, 1981, Ser. No. 308,268
Int. Cl.³ B60D *1/14*
U.S. Cl. 280—482 **4 Claims**

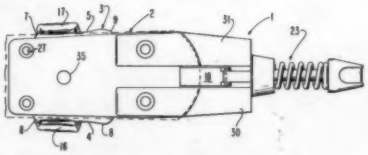
1. A method for attaching a trailer tongue extender to a trailer tongue consisting of:
a. hooking a latch tab at one end of the extender into a receptacle attached on the trailer tongue;
b. inserting a trailer ball, located on the extender between 0.2 meters and 0.7 meters from the latch tab, into the trailer coupler at the end of the trailer tongue; and
c. tightening the trailer coupler.

4,407,520

SKI BOOT LOCATING APPARATUS

Richard G. Spademan, 130 Country Club Dr. #30, Incline Village, Nev. 89450

Filed Apr. 20, 1981, Ser. No. 255,623
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—624 **1 Claim**



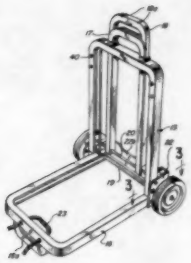
1. A ski binding having means for securing a ski boot to a ski rearward of the toe and forward of the rear of the heel of the ski boot and means for locating the heel of the ski boot in a predetermined position relative to said securing means preparatory to securing said ski boot in said binding, said binding comprising:
(a) ski mounted heel receiving means having a curved surface corresponding to the shape of the rear surface of the heel of said ski boot,
(b) a boot mounted plate with inwardly curved side edges, the narrowest width of said plate being located toward the aft portion thereof, and
(c) a pair of ski mounted side clamping members for engaging said curved side edges,
whereby when said clamping members engage said plate, said plate is drawn forwardly until said clamping members are in engagement with said narrowest width of said plate and said heel portion of said boot is at a sufficient distance from said heel receiving means to clear the forward edges thereof upon lateral release of said boot.

4,407,521

FOLDABLE HAND CART

Wolf Zeitlin, 2814 Gregory St., Chicago, Ill. 60625

Filed Nov. 24, 1980, Ser. No. 209,666
Int. Cl.³ B62B 1/12
U.S. Cl. 280—655 6 Claims



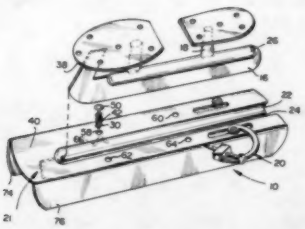
1. A folding, collapsible hand cart comprising: a load-carrying platform frame having an arch shape with side bars which are attached to a pair of rearward side plates along portions thereof which are forwardly bent from a back wall reinforcing said side plates; a first shaft and wheel assembly passing through said side plates and the ends of said bars to add stability to said platform; said side plates further having a second shaft secured to them above said first shaft and spaced from said back wall and an opening in one of said side plates to receive first locking means positioned on cart handle means, said handle means comprising a main frame carrying extensible, arch-shaped slidable frames, the main frame being of arch shape having side bars which are mounted on said second shaft for pivotal movement of said main frame from a closed position in contact with said platform frame to an open position perpendicular to said platform frame and in locked relationship therewith by the engagement of said first locking means positioned on one of said main frame side bars with said opening in one of said side plates, said extensible frames being located between the side bars of said main frame and slidable through the top of the main frame, said extensible frames being an inner one with lateral channeled uprights opening outwardly, and an outer one with inwardly opening channeled uprights seating in those of the inner frame.

4,407,522

ENERGY SAVING ICE SKATE ATTACHMENT DEVICE

Hyman Suroff, 6813 21st Ave., Brooklyn, N.Y. 11204

Filed Mar. 11, 1983, Ser. No. 474,435
Int. Cl.³ A63C 3/04
U.S. Cl. 280—809 9 Claims



1. An energy saving ice skate device for attachment to ice skates, or the like, also suitable for training skaters comprising:

(a) an elongated frame having,

(i) a centrally disposed longitudinal receptacle provided with an elongated centrally disposed slot adapted to receive the blade of an ice skate therethrough,

(ii) two longitudinal outboard ice skate blades, one positioned on each side of said receptacle by a horizontal portion of said frame, the edges of said outboard blades being coplanar with the edge of said ice skate blade,

(iii) clamp means for releasably affixing said frame to one shoe support post of said ice skate for prohibiting longitudinal movement between said ice skate blade and said outboard blades; and

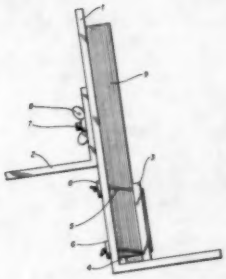
(b) resilient means disposed between said horizontal frame portion and the bottom surface of the shoe portion of said ice skate.

4,407,523

BOOK HOLDER

A. Peter Campione, 32 Jones St., New York, N.Y. 10014

Filed Jan. 11, 1982, Ser. No. 338,421
Int. Cl.³ B42D 17/00; A47B 97/04
U.S. Cl. 281—46 2 Claims



1. A book holder for supporting a book in an open position upon a horizontal surface, which holder comprising in combination

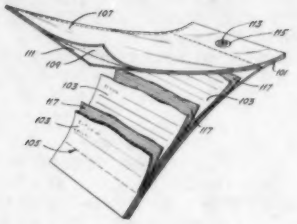
a book supporting structure, consisting of an L-shaped backrest having a perpendicular support lip extending out from its base in a forward direction, said backrest is held in a rearwardly inclined vertical position by means of a back supporting plate; a book is leaned against said backrest's front surface but the book's weight is being supported by a base support lip with a spacer making contact with the book's lower edges, said spacer, being located at the intersection of the base of backrest's front surface and the rear of book support lip's top surface, is a means of holding the book's lower edges above the lip's top surface, thereby creating and maintaining a convenient storage space in which to place the flat plate temporarily, because it would otherwise be an impediment to a safe page turn when so desired by the reader; a rectangular flat plate of transparent material is flexibly supported in a horizontal normal working position in this book holder, with its back surface making contact with and pressing against the entire width of the open pages' lower margins, said flat plate providing a rearwardly exerting force against said open pages, said force being generated by means of elastics whose degree of tension is proportional to the thickness of the open book, said elastics, located at each extreme end of the flat plate, are threaded through holes in the flat plate and bypass the vertical edges of the open book, attach to the backrest, through which they also pass through holes, and are terminated and held captive by some means to the backside of the backrest; by varying the working length of each elastic used at the extreme ends of the flat plate, an additional means is provided by which the flat plate can vary its rearwardly exerting force applied against the pages of the open book.

4,407,524

DURABLE DATA-TAG WITH RECORD DUPLICATION

Ray W. Trautlein, Dublin, Pa., assignor to Lem Products, Inc., Doylestown, Pa.

Filed Sep. 11, 1980, Ser. No. 186,161
Int. Cl.³ B41L 1/14; G09D 3/00
U.S. Cl. 282—9 R 12 Claims



1. A tag with record duplication comprising:

means for receiving data on one surface thereof, said data receiving means forming the backer sheet of said tag;

means for receiving an identical copy of data received by said data receiving means, said identical copy receiving means including sheets detachably secured to said data receiving means at a first end thereof;

means for providing a duplicate data imprint on said identical copy receiving means sheets and said data receiving means backer sheet, said duplicate data imprint means including imprint sheets interleafed with said identical copy receiving means sheets and being detachably secured to said data receiving means backer sheet at said first end thereof; wherein the detachment of said identical copy receiving means sheets and said duplicate imprint means sheets completely separates all of them away from said data receiving means backer sheet; and

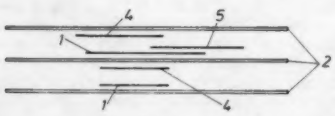
means for sealing said data imprint on said data receiving means backer sheet, said sealing means being attached to said data receiving means at the end opposite said first end.

4,407,525

IDENTIFICATION CARD WITH HALLMARK FOR AUTHENTICATION BY INCIDENT AND TRANSMITTED LIGHT

Joachim Hoppe, Munich, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 81,704, Oct. 4, 1979. This application May 13, 1981, Ser. No. 263,373
Int. Cl.³ B42D 15/02; G09F 3/02
U.S. Cl. 283—110 13 Claims



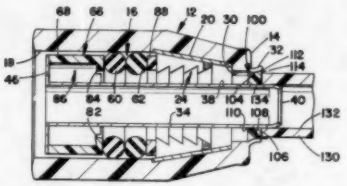
1. In an identification card adapted to be authenticated by transmitted and reflected light comprising at least one substrate layer of substantially homogeneous color or having a substantially uniform color layer thereon; said card also having partially overlapping layers of colors comprising complementary design portions providing desired visual effects whereby light transmitted through the overlapping areas of the color layers is less than the light transmitted through the nonoverlapping areas so that the overlapping areas appear darker to the eye than the nonoverlapping areas when light is transmitted therethrough, and whereby light reflected from the overlapping areas visually possesses greater color intensity than the surrounding, the improvement comprising forming the layers of colors on at least two discrete substrate layer surfaces of said card whereby said complementary design portions are disposed in spaced planes.

4,407,526

TAB-TYPE COUPLING AND METHOD

Christopher W. Cicenas, Madison, Ohio, assignor to Perfection Corporation, Madison, Ohio

Filed Jan. 5, 1981, Ser. No. 222,346
Int. Cl.³ F16L 47/00
U.S. Cl. 285—27 21 Claims



1. In a stab-type coupling for couplingly receiving an end portion of a pipe wherein said coupling includes a body having a first end and an internal recess extending inwardly from said first end adapted to receive the pipe end portion, an elongated hollow insert disposed within said recess and about which the pipe end portion is adapted to be received, and at least a pipe gripping member disposed within said recess surrounding a portion of said insert in a radially spaced relationship with said gripping member including pipe gripping means disposed on the inner surface thereof adapted to retainingly engage a pipe end portion inserted axially therepast into said coupling body recess, the improvement comprising:

a chamfer ring receivable through a central passage therein onto the exterior of said elongated insert adjacent said coupling body first end, said chamfer ring being retainingly received on said insert against accidental displacement therefrom during handling of said coupling while being axially movable therealong under the influence of an axial force applied thereto, said chamfer ring including a forward end area facing said first end and a rear end area adapted to be engaged by the end face of a pipe, said forward end area having an outer diameter at least generally as large as the outside diameter of a pipe which is to be inserted into said coupling, whereby as the end portion of a pipe is urged axially along said elongated insert and into said coupling body recess from said body first end said chamfer ring will be urged along said insert ahead of the pipe end portion in order that the chamfer ring forward end area will act as a pipe end portion lead through the gripping member means to facilitate ease of pipe end portion insertion into said coupling.

4,407,527

SELF-ALIGNING CONNECTOR ASSEMBLY

Larry E. Reimert, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.

Filed Aug. 24, 1981, Ser. No. 295,679
Int. Cl.³ F16L 15/00
U.S. Cl. 285—27 4 Claims

1. Apparatus for connecting tubular members of any size diameters, while preventing cross-threading, comprising:

a. a first tubular member having tapered, external threads toward a first end thereof;

b. a generally cylindrical external surface, as part of said first tubular member, axially displaced relative to said external

threads and on the opposite side thereof from said first end;

c. a second tubular member having generally circular guide means toward a first end thereof;

d. said second tubular member further having tapered, internal threads generally complementary to said external threads, and axially displaced relative to said guide means;

e. wherein:

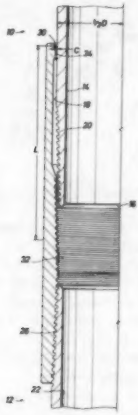
i. L is the axial displacement between said guide means and said internal threads;

ii. X is the inverse of the axial distance between adjacent threads of said external threads;

iii. D is the outside diameter of the external surface;

iv. C is one-half the difference between the inside diameter of said guide means and D; and

v. L is at least as large as the quantity 2XDC;



f. so that said first and second tubular members, regardless of their respective diameter sizes, may be threadedly connected by means of said external threads and said internal threads with said second tubular member generally receiving said first tubular member, said guide means cooperating with said external surface of said first tubular member, and L being sufficiently large, to limit the range of relative rotational orientation between said first and second tubular members with said first tubular member extending within said second tubular member a sufficient distance for said external and internal threads to make contact and prior to rotational thread make-up of said external and internal threads, said limited relative rotational orientation range being sufficiently small as to prevent cross-threading of said external and internal threads during rotational thread make-up.

4,407,528

HIGH PRESSURE INSULATING FLANGE

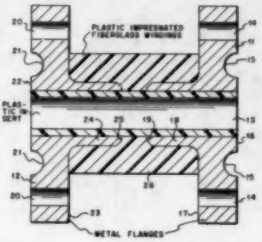
Donald R. Anthony, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 14, 1981, Ser. No. 330,112

Int. Cl.³ F16L *11/12, 9/14, 33/00;* **H02G** *15/24*

U.S. Cl. 285—50 **2 Claims**

1. A high pressure insulating coupling for use in a pipeline comprised of two metal half flanges, each of said half flanges having an outer face surface, an inner face surface, and an inner tubular extension, said half flanges being supported on a non-conductive cylindrical nonmetallic member in a manner such that the inner faces of said half flanges face each other and the inner tubular extensions point toward each other without touching each other, and plastic impregnated fiberglass windings around said inner tubular extensions between said inner face surfaces of said half flanges, said fiberglass windings and said cylindrical nonmetallic member forming a layer between



said inner tubular extensions of sufficient thickness to withstand the working pressure of said pipeline.

4,407,529

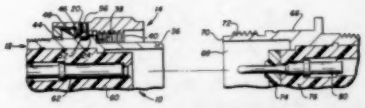
SELF-LOCKING COUPLING NUT FOR ELECTRICAL CONNECTORS

Howard E. Holman, Fort Worth, Tex., assignor to T. J. Electronics, Inc., Arlington, Tex.

Filed Nov. 24, 1980, Ser. No. 209,429

Int. Cl.³ H01R *13/54*

U.S. Cl. 285—82 **21 Claims**



1. A self-locking coupling nut comprising:

a first cylindrical shell including a radially inwardly located, axially extending ball receiving surface, a ball camming surface extending angularly outwardly from the ball receiving surface, and a plurality of ball receiving grooves intersecting the ball camming surface and positioned at spaced intervals around the periphery of the first shell, the innermost surface of each ball receiving groove positioned radially outwardly from the ball receiving surface, each adjacent pair of ball receiving grooves being separated by a land;

a second cylindrical shell for mating engagement with the first shell and having external threads thereon;

cooperating surfaces on the first and second shells for locating the shells with respect to each other upon mating engagement therebetween;

a nut surrounding the first shell and having threads for threadedly engaging the threads of the second shell to secure the first and second shells in mating engagement, a plurality of radially extending ball receiving apertures each initialy aligned with the ball receiving surface of the first shell, and a circumferentially extending spring receiving slot intersecting each of the ball receiving apertures;

a plurality of balls each positioned in one of the ball receiving apertures of the nut for movement therewith from initial engagement with the ball receiving surface of the first shell up the ball camming surface thereof and into engagement with the ball receiving grooves in response to threaded engagement of the nut with the second shell thereby locking the nut until a force sufficient to urge the balls up and over the lands separating the ball receiving grooves is applied; and

a spring positioned in the spring receiving slot of the nut for retaining the balls in the ball receiving apertures and for urging the balls inwardly toward the first shell, the spring being cammed outwardly as the balls move up the ball

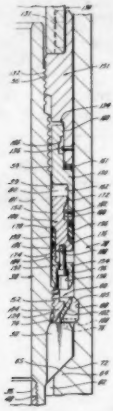
camming surface into the ball receiving grooves thereby indicating the locked condition of the self-locking coupling nut.

4,407,530

PACKOFF APPARATUS

John H. Fowler, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 22, 1980, Ser. No. 219,253
Int. Cl.³ E21B *33/04*
U.S. Cl. 285—140 **17 Claims**



1. A sealing assembly for sealing the annulus between a hanger and a head, comprising:

an intermediate tubular member;

a lower tubular member disposed below and reciprocably mounted on said intermediate tubular member;

an upper tubular member disposed above and reciprocably mounted on said intermediate tubular member;

first sealing means disposed on said lower tubular member and engageble with said intermediate tubular member for sealing enggement with the hanger;

second sealing means independent of said first sealing means disposed on said intermediate tubular member and engageable with said upper tubular member for sealing engagement with the head; and

compression means for compressing said lower, intermediate and upper tubular members together, said first and second sealing means sealingly engaging the hanger and head in series whereby said second sealing means may be further compressed between said upper and intermediate tubular members after the compression of said first sealing means between said lower and intermediate members has been completed.

4,407,531

EXTERNALLY ADJUSTABLE SEAL AND BEARING STRUCTURE

Russell G. Raush, Conestoga, and Raymond A. Alleman, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,063
Int. Cl.³ F16L *5/02*
U.S. Cl. 285—158 **9 Claims**

1. A seal and bearing structure for admitting fluid to the inside of a container from a fluid source external of said container comprising:

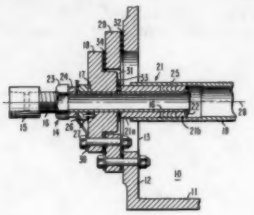
a stop plate having a bore extending from the outside of said container to the inside of said container;

an external tube passing through said bore for admitting fluid to the inside of said container;

an internal tube coaxial with and oscillatory with respect to said external tube and positioned so that said tubes overlap;

bearing means having at least two bearing portions arranged radially between and coaxial with said external and internal tubes whereby said tubes are longitudinally oscillatory with respect to one another, one of said bearing portions contacting said stop plate;

seal means arranged radially between and coaxial with said external and internal tubes, and positioned longitudinally between said bearing portions;



retainer means for retaining the overlapping relationship of said tubes;

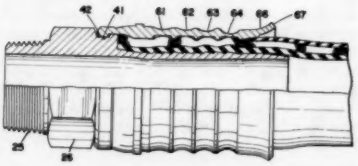
external means for longitudinally moving said external tube with respect to said internal tube whereby said stop plate and said retainer means compress said bearing means against said seal means to radially expand said seal means against said external and internal tubes to prevent fluid leakage along said tubes; and a thrust bracket coupling said stop plate and said external tube for preventing longitudinal movement of said external tube in response to pressure in said internal tube.

4,407,532

HOSE END FITTING

Hiralal V. Patel, Mentor, and Samuel A. Rudolph, Cleveland Heights, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Jan. 26, 1981, Ser. No. 228,317
Int. Cl.³ F16L *33/20*
U.S. Cl. 285—256 **4 Claims**



1. A hose end assembly comprising a metal hose coupling and a flexible reinforced hose having an inner bore, an outer surface, and an end surface, said hose coupling including an insert portion within said hose bore and a radial abutment adjacent said hose end surface, said hose coupling including a sleeve member secured to said insert member on the side of said abutment away from said hose end surface, said sleeve and insert portion cooperating to form an annular axially extending hose receiving zone, said sleeve extending inwardly over the hose outer surface and being deformed radially inward to make gripping contact with said hose outer surface in said hose receiving zone, said insert portion radially internally supporting the hose area gripped by said sleeve in said hose receiving zone, said insert portion having a plurality of uniformly axially spaced, radially outwardly extending annular ridges in engage-

ment with said hose inner bore, each of said annular insert ridges having substantially the same cross-sectional shape and size in a longitudinal plane, said sleeve on its inner surface adjacent said hose outer surface having at least three uniformly axially spaced, radially inwardly extending annular ridges in gripping engagement with said hose outer surface in said hose receiving zone, each of said annular sleeve ridges having substantially the same cross-sectional shape and size in a longitudinal plane, the number of insert ridges in said hose receiving zone being greater than the number of sleeve ridges, said sleeve having a plurality of annular grooves on its outer surface with each axial groove being in axial alignment with a space between adjacent inwardly extending annular sleeve ridges, said grooves being progressively deeper axially away from the hose end surface to provide progressively decreasing radial thickness of said sleeve at portions extending progressively away from said hose end surface, the hose receiving zone bounded radially outwardly by said sleeve ridges and radially inwardly by said insert ridges having substantially the same hose receiving volume per unit length along substantially its full length.

4,407,533
HIGH PRESSURE SWIVEL JOINT

James F. Giebeler, San Bernardino, Calif., assignor to Arrowhead Continental, San Bernardino, Calif.

Filed Oct. 1, 1981, Ser. No. 307,441
Int. Cl.³ F16L *27/00, 17/00, 23/00, 21/00*
U.S. Cl. 285—281 **6 Claims**

1. In a device for connecting two pipes for carrying abrasive material under high pressure, the two pipes having substantially the same outside diameter and wall thickness, the combination of: a flange member welded to one end of one of the pipes and having an inside diameter substantially equal to that of the pipe, a ring member welded to an end of the other pipe and having an internal diameter substantially the same as that of said flange member, said ring member having an integral annular outward-extending rib, a tension sleeve encircling said flange member, ring member and rib, said tension sleeve having at one end a first inwardly directed lip engaging a shoulder on said flange member, said tension sleeve having at the other end a second inwardly directed lip encircling a portion of said ring member, said second lip and said rib defining an annular pocket between said tension sleeve and said ring member, an anti-friction bearing assembly in said annular pocket and containing roller elements acting only in compression, said tension sleeve comprising two semi-circular halves, and at least one continuous circumferential band encircling the tension sleeve to hold the two halves thereof against radial separation.

4,407,534
ARRANGEMENT FOR CONNECTING EDGE AREAS OF THIN-WALLED BODIES

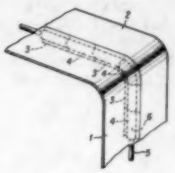
Günter Petz, Flachslander Str. 8, Nürnberg D 8500, Fed. Rep. of Germany

Filed Oct. 21, 1980, Ser. No. 199,346
Claims priority, application European Pat. Off., Jan. 2, 1980, 80100 001.9
Int. Cl.³ F16L *37/14*
U.S. Cl. 285—305 **1 Claim**

1. An improved arrangement for joining adjacent edge areas of thin-walled bodies, wherein the corresponding edge areas are each provided with a plurality of bent sections and a plurality of recesses, with the bent sections and recesses of one edge area being offset with respect to the bent sections and recesses of the corresponding edge area, thereby permitting the bent sections of one edge area to be disposed through the recesses of the corresponding edge area so that the bent sections of both edge areas collectively define a cylindrical channel for receiving an elongate member to secure the bodies together, which arrangement comprises:

(a) a corner section carried by each edge area and disposed transversely to the plane of its corresponding body to define a free end;

(b) the plurality of bent sections are carried by the free end of each corner section, with each bent section having a



substantially semi-cylindrical depression and separated from an adjacent bent section by a recess;

(c) the depressions of the bent sections of one corner section alternate with and are adjacent to the depressions of the bent sections of the corresponding corner section;

(d) when the edge areas are joined to form the cylindrical channel, the joined bodies define an interior joint side and an exterior joint side, wherein;

i. the cylindrical channel and corner sections are disposed on and visible only from the interior joint side; and

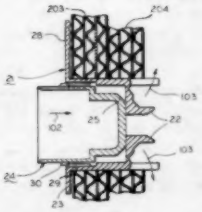
ii. the exterior joint side presents a linear joint line defined by abutting portions of the edge areas; and

(e) elongated means disposed in the cylindrical channel for securing the edge areas together.

4,407,535
CONTAINER-LOCKING MECHANISM

Katsutoshi Ohnuki, and Yasuo Suzuki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,207
Claims priority, application Japan, Feb. 16, 1981, 56-20333[U]; Jul. 23, 1981, 56-109525[U]
Int. Cl.³ E05C *3/06, 3/16, 7/00*
U.S. Cl. 292—27 **13 Claims**



1. A container-locking mechanism for locking two overlapping sections of a carton, or the like, each section having a hole, with the two holes in alignment when said two sections are in a closed position, the mechanism comprising: an outer tubular member adapted to be fitted into the aligned holes in the overlapping sections, one end of said tubular member having a radially outwardly extending flange; an inner tubular member having at one end a plurality of circumferentially

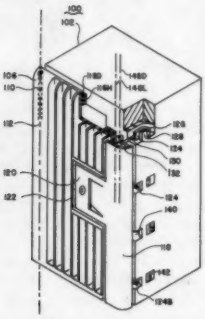
spaced tapered portions, said outer tubular member having at the other end a plurality of radially arranged arms, said tapering portions engaging said arms and forcing said arm radially outwardly beyond the outer peripheral surface of said outer tubular member when the inner tubular member is fittingly inserted into the outer tubular member while said outer member is fitted in the aligned holes in the overlapping sections, to clamp said sections against each other in cooperation with said flange on the outer tubular member; and locking means for locking the inner tubular member in a position fully inserted into the outer tubular member.

4,407,536

SINGLE THROW MULTI-GRIP LATCHING MECHANISM

Marvin L. Kausch, San Jose, Calif., assignor to Cromemco Inc., Mt. View, Calif.

Filed Feb. 17, 1981, Ser. No. 235,167
Int. Cl.³ E05C 5/00
U.S. Cl. 292—29 **14 Claims**



1. An environmental chamber having an operator access port which may be quickly unlatched opened closed and latched by the operator, and having a peripheral gasket which is reseated after each operator access, comprising;

a housing forming the chamber, with an elongated access port therein;

an elongated closure means for covering the access port, having a pair of opposed elongated sides;

hinge means for hingedly securing the closure means to the housing along an open-close axis proximate one of the elongated sides of the closure means;

peripheral gasket means seated between the housing and the closure means when the closure means is latched for sealing the access port;

over-center linking means pivotally secured to the elongated closure means along a linking axis proximate the unhinged elongated side thereof;

over-center latching structure extending along the unhinged elongated side of the closure means, and pivotally secured to the over-center linking means along a latching axis displaced from the linking axis;

a plurality of spaced latching fingers positioned along the latching structure and extending therefrom toward the housing;

threaded means on each latching finger for adjusting the operative length thereof;

latching flange means formed at the end of each latching finger;

a plurality of correspondingly spaced shoulder means on the housing for releaseably engaging the latching flange means;

a plurality of cavities in the housing, one positioned next to each shoulder means for receiving the latching fingers;

finger stop means extending from the latching structure next to each latching finger for guiding the latching fingers into the cavity to a position proximate the shoulder means; and

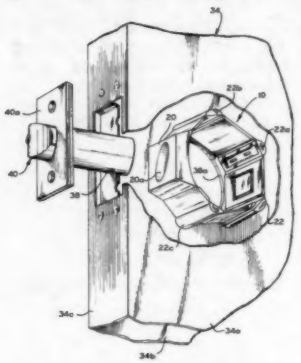
a handle portion extending from the latching structure by which the operator pivots the latching structure and swings the latching axis along an arc about the linking axis towards the over-center position relative to the linking axis, causing the flange means to engage the shoulder means to pull the unhinged side of the closure means closer to the housing causing the peripheral gasket means to seat around the access port, and for further pivoting beyond the over-center position to bias the latching structure in the latched position.

4,407,537

DOOR AND LOCK SUPPORT

Earl J. Ames, P.O. Box 7496, Toledo, Ohio 43615

Filed Oct. 20, 1981, Ser. No. 313,164
Int. Cl.³ E05B 9/08; E04C 2/52
U.S. Cl. 292—337 **5 Claims**



1. An annular reinforcing device for insertion interiorally into a hollow door for surrounding an internally disposed retracting mechanism and receiving a retractable bolt associated with the retracting mechanism, comprising:

(a) an elongate, substantially flat flexible member;

(b) said elongate, substantially flat flexible member including a number of spaced reinforcing rib portions extending transversely of said elongate, substantially flat flexible member;

(c) a panel section disposed between adjacent rib portions, one of said panel sections having an aperture for receiving the retractable bolt;

(d) hinge means interconnecting the adjacent edges of said rib portions and said panel sections; and

(e) detachable interconnecting means affixed to the opposed ends of said elongate, substantially flat flexible member for forming said flexible member into an annular configuration whereby said annular reinforcing device may be folded into a compressed shape and inserted into the interior of the hollow door.

4,407,538

BISTABLE LATCH

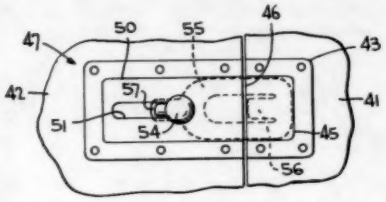
Peter Bauer, 13921 Esworthy Rd., Germantown, Md. 20767

Filed Jan. 23, 1981, Ser. No. 227,731
Int. Cl.³ E05C 19/06
U.S. Cl. 292—87 **11 Claims**

1. A latch mechanism for permitting selective engagement and disengagement of relatively movable first and second members, said latch mechanism comprising:

a positionally bistable member secured to said first member and comprising an endless band of spring-like material and

having an outer rim and an inner rim which circumscribes a cut-out portion, said band having first and second stable positions wherein said inner rim is disposed on opposite sides respectively of said outer rim, said bistable member further including a latching tongue formed integrally with said endless band and projecting longitudinally from said band to terminate in a distal end, said tongue having first and second orientations which it assumes in said first and second stable positions, respectively, of said band;



surface means secured to said second member and positioned, when said first and second members are engaged, to abut said distal end of said tongue and prevent disengagement of said first and second members when said band is in said second stable position; and

means for selectively applying bending forces to said bistable member to permit said bistable member to be selectively snapped between said first and second stable positions.

4,407,539

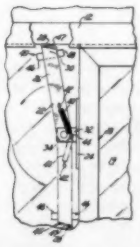
LATCH FOR SLIDING GLASS DOOR

Ralph T. Asp, 4160 W. Walton, Drayton Plains, Mich. 48020

Filed Aug. 28, 1981, Ser. No. 297,094

Int. Cl.³ E05C *17/12*

U.S. Cl. 292—338 **5 Claims**



1. A locking device for a sliding door mounted in a track comprising:

a pivotal lever mounted on the upper forward edge of the sliding door, said lever pivotal between an active upper locking position and a lower inactive position, said lever further having an upper toothed end portion engageable with the opposed track in its upper locking position;

a biasing spring operably connected to said lever for maintaining it in one of said positions; and

a resilient molded member mounted at the upper end of said lever, said member including a forward and a rearward bumper, said molded member including a further protective rim alongside and slightly above said toothed portion.

4,407,540

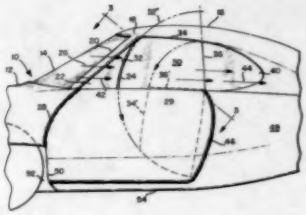
WINDOW CONSTRUCTION FOR PASSENGER VEHICLES

Walter H. Korff, 449 N. Lamer St., Burbank, Calif. 91506

Filed Aug. 7, 1981, Ser. No. 291,087

Int. Cl.³ B60J *1/00*

U.S. Cl. 296—146 **17 Claims**



1. A window construction for passenger vehicles having improved aerodynamic characteristics in combination with a closed passenger body having a front windshield, a roof, and a pair of side passenger doors, comprising:

a. said front windshield having a pair of side edges with a curved section adjacent each of said side edges;

b. a pair of side window assemblies, each of said side window assemblies being disposed in an associated one of said side passenger doors;

c. said side window assemblies each having a front segment and a rear segment, said front segment having a forward edge, and at least one of said segments being movable;

d. said side window assemblies each having a generally convex surface;

e. a pair of "A" posts, each of said "A" posts being disposed between one of said side edges and said forward edge of an associated one of said side window assemblies and each of said "A" posts having a pair of associated edges;

f. said front windshield assembly, said "A" posts, and said side window assemblies each having an external surface;

g. each side edge abutting one edge of said pair of associated edges of each of said "A" posts whereby said front windshield external surface is aligned with each external surface of said pair of "A" posts; and,

h. said forward edge of each side window assembly abutting said other one edge of said pair of associated edges whereby each "A" post external surface is aligned with said associated side window assembly external surface for providing an integral unitary aerodynamic surface.

4,407,541

SLIDING ROOF

Robert T. Boots, Haarlem, Netherlands, assignor to Vermeulen-Hollandia Octrooien B.V., Haarlem, Netherlands

Filed Jun. 12, 1981, Ser. No. 273,107

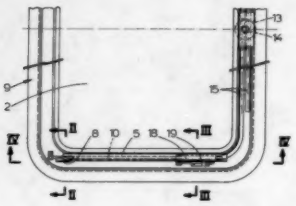
Claims priority, application Netherlands, Jun. 24, 1980, 8003639

Int. Cl.³ B60J *7/04*

U.S. Cl. 296—216 **20 Claims**

14. A sliding roof for a vehicle, having a fixed roof with an opening therein, comprising a panel which in its forward and lowermost position closes said opening in said fixed roof; at least one front support, guided in said vehicle for backward and forward movement in the longitudinal direction of the vehicle, said front support carrying a horizontal cross shaft which supports the panel near the front end of said panel, said front support occupying its foremost position in the closed position of the panel; an actuating member engaging said front support and adapted to move the same backward and forward; at least one lever, which is supported at its lower end in the vehicle for pivotal movement about a horizontal transverse axis, said lever occupying its foremost position in the closed

position of the panel; a cross pin connected to the upper end of said lever; a slot formed underneath said panel and associated therewith, said cross pin slidably engaging said slot and occupying its rear position in said slot in the closed position of said panel; resilient means loading the cross pin in the rearward direction of said slot; and a stop means defining the position of



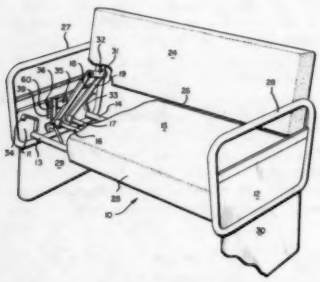
said lever wherein a displacement of said slot with respect to said cross pin is initiated, said pivotal lever movement before said latter lever position is reached raising the rear edge of said panel with respect to its lowermost position, while said displacement of said slot with respect to said cross-pin causes said panel with its raised edge to be partly displaced outside the roof opening into positions above the fixed roof.

4,407,542

WALK-OVER SEAT WITH LATCH

Norman J. Kehl, Elk Grove Village, and Richard D. Unser, Wood Dale, both of Ill., assignors to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed May 8, 1981, Ser. No. 261,772
Int. Cl.³ B60N *1/02*
U.S. Cl. 297—103 **16 Claims**



1. A walk-over seat having front and rear ends and comprising:

a base having a pair of side members;

a horizontal rod extending between said side members;

a seat back;

a link having an upper end connected to said seat back and a lower end;

means mounting said lower end on said rod for pivotal movement of said link about the axis of said rod and along a path extending between a first position, in which the link extends angularly upwardly from the rod towards said front end of the seat, and a second position in which the link extends angularly upwardly towards said rear end of the seat;

a first latch member;

means mounting said first latch member on a side member, for pivotal movement of said first latch member about a vertical axis between a locking position, in which said latch member extends outwardly from said side member in said path of movement of said link, and a retracted position in which said first latch member does not extend into said path;

means normally urging said first latch member toward its locking position;

means on said first latch member engageable by said link when the link moves from its first to its second position, for pivoting said first latch member from its locking to its retracted positon;

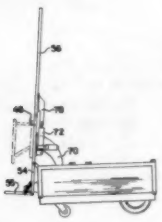
and means for preventing movement of the first latch member from its locking position upon being engaged by said link member when the link member is urged from its second to its first position.

4,407,543

MECHANIZED WHEELCHAIR

David Mashuda, R.D. #1, Evans City, Pa. 16033

Filed Oct. 30, 1981, Ser. No. 316,680
Int. Cl.³ A61G *5/04*
U.S. Cl. 297—330 **4 Claims**



1. In a mechanized wheelchair of the type comprising a rectangular body frame supported on front and rear pair of wheels, a rectangular seat frame pivotally mounted at its forward end on the forward end of the body frame and being swingable upwardly from a horizontal position in which it rests on the body frame to an upright position, a rectangular back frame pivotally mounted on one end of the rear end of the seat frame being swingable from a horizontal position in which its rear end rests on the body frame to an upright position, a pair of leg rest frames pivotally connected at their upper ends to the forward end of the seat frame and being swingable from a downwardly extending position upwardly into a position co-planar with the seat frame, the improvement comprising a base frame mounted on the wheels at corners of the body frame so as to position the body frame on the base frame for vertical telescoping movement thereon, a lever arm affixed to the bottom of the seat frame extending downwardly therefrom, first power operated means attached to the body frame to the rear end of the seat frame and to the free end of said lever arm for swinging the seat supporting a person from horizontal to upright position by pulling the lever arm, and second power operated means mounted on the base frame and attached to the body frame for raising and lowering the frame supporting a person with respect to the base frame.

4,407,544
APPARATUS FOR ELIMINATION PLAY IN GEAR WHEEL TRANSMISSIONS

Horst Bähring, Mühltal, Fed. Rep. of Germany, assignor to Privates Institut für Physikalisch Technische Auftragsforschung GmbH, Reinheim, Fed. Rep. of Germany

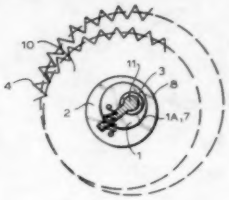
PCT No. PCT/EP80/00029, § 371 Date Jan. 28, 1981, § 102(e) Date Jan. 7, 1981, PCT Pub. No. WO80/02677, PCT Pub. Date Dec. 11, 1980

PCT Filed May 24, 1980, Ser. No. 229,578

Claims priority, application Fed. Rep. of Germany, May 28, 1979, 2921588

Int. Cl.³ A47C *1/025*

U.S. Cl. 297—362 **27 Claims**



1. Apparatus for eliminating play between two interengaged gear wheels (4, 10) of a gear wheel transmission which is self-locking in relation to a moment of rotation acting on the output side and includes two disc-like transmission elements (1, 2) each associated with the respective gear wheel, characterized by the combination of the following features:

(a) the central axis (2M or 1M) of each of the disc-like transmission elements (2 or 1) is concentric with respect to the axis of rotation (10D or 4D) of the respective gear wheel (10 or 4);

(b) the spacing of the axes of rotation (4D, 10D) of the two gear wheels (4, 10) is a function of the rotation of the disc-like transmission elements (1, 2) relative to each other;

(c) a spring (12) is connected to both disc-like transmission elements (1, 2) in such a way that the two disc-like transmission elements (1, 2) are pivoted relative to each other by the spring force in a direction, such that the displacement of the central axes (1M, 2M) of the disc-like transmission elements relative to each other in radial direction increases and thus play between the gear wheels (4, 10), which are connected to the respective disc-like transmission elements (1, 2), is removed; and

(d) a handle (16) is connected to one of said gear wheels (10) by way of an adjusting shaft (5) and the disc-like transmission elements (1, 2) in such a way that, upon rotary movement in either of the two directions of rotation, said one gear wheel is rotated relative to the other gear wheel (4) and at the same time the respective disc-like transmission element (1, 2) is moved in the direction of slightly increasing the play between the two gear wheels (4, 10).

4,407,545
MINE SYSTEM

Brian R. Stoppani, Doncaster, England, assignor to Mining Supplies Limited, England

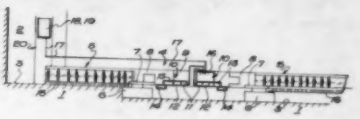
Filed Oct. 15, 1980, Ser. No. 197,332

Claims priority, application United Kingdom, Oct. 19, 1979, 7936340

Int. Cl.³ E21C *29/00*

U.S. Cl. 299—30 **4 Claims**

1. A mine system comprising at least one mining machine of the shearer or trepanner type adapted to haul itself, in a reciprocal manner, along a mineral face, a mine roadway located at one end of said mineral face, conveyor means extending along said mineral face to guide said mining machine and to transport the mineral to the roadway, rack means attached to said conveyor and extending longitudinally therealong, a self-contained haulage unit carried by said machine and including at least one variable speed electric motor, a haulage sprocket coupled to said motor for engaging said rack means, a control box for said haulage unit located in said roadway and means for electrically connecting the same to said machine, a terminal



box housed in said machine to receive said connecting means, and electrical coupling means between said terminal box and said motor, whereby said self-contained haulage unit and in particular the supply of electrical power to said electric motor of said haulage unit is controlled through said roadway located control box.

4,407,546
MINING PLANER WITH PIVOTAL TOOL HOLDER

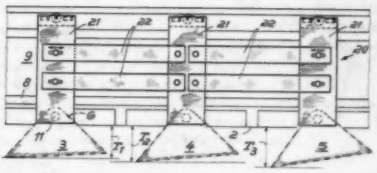
Ernst Braün, and Gert Braün, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Filed Mar. 20, 1981, Ser. No. 246,017

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011100

Int. Cl.³ E21C *27/35*

U.S. Cl. 299—34 **28 Claims**



1. A planer assembly for winning minerals from a mineral face comprising:

a planer guide member;

at least two planers engaged with said guide member and slidable therealong in a travel direction;

hinge means interconnecting said at least two planers for transferring moments applied to each of said planers; and

a planer tool holder for holding at least one planer tool mounted on each of said planers and positioned to make a cut in the mineral face of a selected depth, the depth increasing from planer to planer in a direction opposite the travel direction;

said hinge means comprising a connecting lug rigidly connected to each of said planers and extending outwardly therefrom, a hinge bolt extending substantially perpendicular to the travel direction and through connecting lugs of adjacent planers for interconnecting said adjacent planers for permitting relative movement at an angle in a vertical plane of adjacent planers.

4,407,547

HYDRAULIC BRAKING SYSTEMS FOR VEHICLES

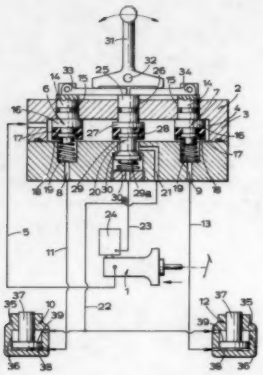
Roy E. Edwards, Warley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 16, 1981, Ser. No. 254,602

Claims priority, application United Kingdom, Apr. 17, 1980, 8012658

Int. Cl.³ B60T 11/12

U.S. Cl. 303—6 A 10 Claims



1. An hydraulic braking system for a vehicle comprising brakes on opposite sides of the vehicle, actuator means for operating said brakes, a single pedal-operated hydraulic master cylinder for supplying hydraulic fluid to said actuator means to apply said brakes, a selector valve assembly for controlling independently or simultaneously the supply of hydraulic fluid to said actuator means for said brakes on one or both sides of the vehicle, whereby said brakes can be applied independently for steering or simultaneously for retarding the progress of the vehicle, and brake torque regulating means operable in conjunction with said selector valve assembly, said selector valve assembly comprising a housing having an inlet port and a pair of outlet ports, a distribution chamber in said housing, a pair of normally open diverter valves, and valve control means, said inlet port being connected to said master cylinder, each outlet port being connected to a respective one of said actuator means, each diverter valve controlling communication between said distribution chamber and a respective one of said outlet ports, and said valve control means being operable to simultaneously close either one of said diverter valves and operate said torque regulating means, whereby, for a given pedal force, an output torque from each said brake is greater when the said brake is applied independently of said brake on the opposite side of said vehicle than when both said brakes are applied simultaneously.

4,407,548

AIR SERVICE BRAKE EXHAUST CONTROL SYSTEM

John M. Graham, 921 Sequoia Ave., Millbrae, Calif. 94030

Continuation-in-part of Ser. No. 152,590, May 23, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 320,892

Int. Cl.³ B60T 13/22

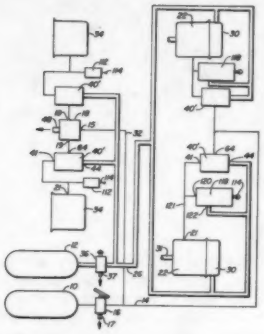
U.S. Cl. 303—6 M 18 Claims

1. An air service brake exhaust control system adapted for controlling the exhaust of air from an air service brake assembly, the assembly including a housing, a service chamber defined by said housing, a housing inlet formed in said housing and fluidly communicating with the service chamber, and an actuator responsive to the pressure within said service chamber, the system comprising:

exhaust valve means, having an exhaust port, for fluidly connecting said housing inlet to a service brake pressure source or to said exhaust port for discharge to atmosphere; and

a pilot check valve having a first port fluidly coupled to said exhaust port, a second/exhaust port fluidly coupled to said first port, check valve means for blocking fluid flow from said fluid port to said second/exhaust port, a control port, and means, responsive to the presence of a control pressure at said control port of at least a first value, for overriding said check valve means to allow relatively free flow of fluid from said first port to said second/exhaust port;

whereby when said control pressure is at least said first valve and said housing inlet is fluidly connected to the service



brake pressure source, fluid from said service brake pressure source is fluidly connected to said service chamber to actuate said actuator; when said control pressure is at least said first value and said housing inlet is fluidly connected to said exhaust port, said housing inlet is fluidly connected to said second/exhaust port to allow the fluid in said service chamber to be exhausted through said second/exhaust port; and when said control pressure is less than said first value, fluid flow from said housing inlet through said exhaust port and to said first port of said pilot check valve is blocked by said check valve means so the pressure within said service chamber is not dissipated by exhausting fluid within said service chamber through the second/exhaust port.

4,407,549

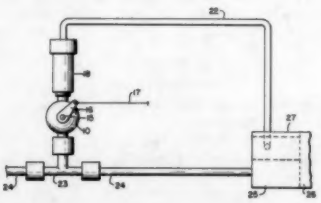
ANTI-SKID DEVICE FOR VEHICLES

George C. Klein, 102 W. Truman Dr., Holiday, Fla. 33590

Filed Jun. 10, 1981, Ser. No. 272,346

Int. Cl.³ B60T 7/02

U.S. Cl. 303—6 C 4 Claims



1. In a vehicle having a hydraulic brake system with front and rear wheel brakes actuated by separate reservoirs in a dual master brake cylinder and separate hydraulic circuit means to said front and rear wheel brakes, means to selectively deactivate said front wheel brakes after said front and rear wheel

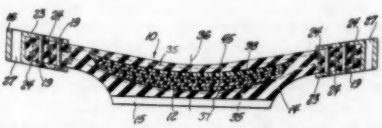
brakes have been activated, comprising a hydraulic by-pass circuit in said hydraulic circuit connecting said front wheel brake reservoir in said master brake cylinder to said front wheel brakes, said by-pass circuit having a by-pass valve as part thereof and being movable between an open position in which a quantity of fluid passes through said by-pass valve back to said master brake reservoir to substantially deactivate said front wheel brakes without deactivating said rear wheel brakes, and a closed position in which said by-pass valve is closed to passage of fluid and said by-pass circuit is inoperative.

4,407,550

RESILIENT BAND STRUCTURE HAVING IMPROVED LAMINATED CORE AND DRIVE SHOES

Algis L. Lapsys, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1981, Ser. No. 245,481
Int. Cl.³ B62D *55/24*
U.S. Cl. 305—35 EB **5 Claims**



1. An annular resilient band structure designed for installation on a ground vehicle to provide tractive propulsion force and vehicle suspension function: said band structure comprising an annular resilient core having a transverse curvature that is convex on its outer surface and concave on its inner surface; first and second substantially inextensible bead structures outboard from the lateral edges of the core; first load transfer cord means extending from the first bead structure to the second bead structure along the outer surface of the resilient core; second load transfer cord means extending from the first bead structure to the second bead structure along the inner surface of the resilient core; and an elastomeric sheath surrounding the core, bead structures and cord means; said resilient core comprising an elongated strip of resilient material (**26**) wound in spiral fashion to define a continuous spiral leaf having a multiplicity of resilient leaf layers; said strip of resilient material having a relatively wide inner end and a relatively narrow outer end, the lateral side edges of the strip becoming progressively narrower from the strip inner end to the strip outer end so that individual leaf layers have progressively narrower transverse widths measured from the inner layer to the outer layer.

4,407,551

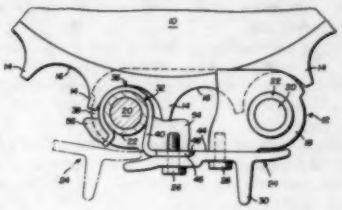
REPLACEABLE WEAR COVER FOR TRACK BUSHING

John M. Baylor, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 1, 1981, Ser. No. 269,128
Int. Cl.³ B62D *55/08*
U.S. Cl. 305—57 **5 Claims**

1. In an endless track assembly of the type used on a machine provided with a drive sprocket having teeth separated by circumferentially disposed spaces between the teeth, said track assembly including a pair of laterally spaced apart track links interconnected by at least one pin fitted within an external bushing, a track plate removably attached by fasteners to said track links, the improvement comprising:

a replaceable wear cover including a generally planar mounting portion which is mounted between said track links and a curved shield portion fitted partially around the outer surface of said bushing, said shield portion directly engaging the circumferentially disposed spaces between the sprocket teeth to protectively shield the bushing against impact with the sprocket thereby increasing its work life; and



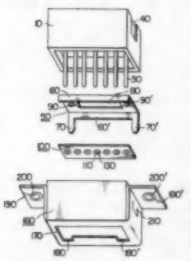
elastomeric block-shaped members secured to opposed sides of said shield portion for engaging the ends of said sprocket teeth prior to the engagement between said wear cover and sprocket.

4,407,552

CONNECTOR UNIT

Masayuki Watanabe; Hiroshi Yamaya, both of Aichi, and Hitoshi Kurohata, Komaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 140,887, Apr. 16, 1980. This application Jun. 21, 1982, Ser. No. 390,333
Claims priority, application Japan, May 18, 1978, 53-67665; Jan. 16, 1979, 54-3693
Int. Cl.³ H01R *13/66*
U.S. Cl. 339—143 R **8 Claims**



1. A connection unit comprising:

an insulating housing having a separation wall;

a plurality of connection pins penetrating said separation wall;

a conductor plate formed with at least one projection and at least one hole of sufficient size to permit said connection pins to pass through said hole without making electrical contact with said conductor plate, said conductor plate being disposed within the insulating housing along the underside of said separation wall;

a dielectric plate formed with a plurality of holes which receive individual connection pins therethrough without making electrical contact with said connection pins, said dielectric plate being disposed within the insulating housing in contact with the underside of said conductor plate;

a plurality of conducting portions formed on the surface of said dielectric plate opposite the surface in contact with the conductor plate and surrounding said holes of the dielectric plate and in electrical contact with said connection pins, thereby effectively forming low-pass filters between said connection pins and conductor plate;

encapsulating resin filling the space within said insulating housing surrounding said conductor plate and said dielectric plate;

a conductive case having a bottom wall formed with at least one hole penetrated by said connection pins and said projection, said connection pins being disposed without making electrical contact with said conductive case and said conductive case accommodating said insulating housing therein; and

means for electrically connecting said projection of the conductor plate to the outside of the bottom wall of said conductive case so as to provide an electromagnetic or magnetic shield by both of said conductor plate and conductive case,

whereby said connector unit is electromagnetically or magnetically shielded by both of said conductor plate and conductive case and shielded from the external environment by the encapsulating resin.

4,407,553

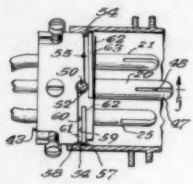
ELECTRICAL CONNECTOR HAVING THREADED CONNECTION BETWEEN RECEPTACLE PARTS

Harold A. Dvorachek, Iola, Kans., and Boleslaw M. Klimek, Des Plaines, Ill., assignors to Echlin Inc., Branford, Conn.

Continuation of Ser. No. 149,123, May 12, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,230

Int. Cl.³ H01R *13/34*

U.S. Cl. 339—14 P **8 Claims**



1. In an electrical connector including a hollow housing member having open forward and rearward portions, a body member of insulating material having a forward end portion adapted to be inserted into said rearward open end portion of said housing member to be positioned in an operative relationship with respect thereto, and contact means carried by said body member for engagement with contact means carried by another body member inserted into said forward open end, said rearward end portion of said housing member and said forward end portion of said body member when in said operative relationship having facing internal and external generally cylindrical surfaces, the cylindrical surface of one of said members being formed with a single helical projection having a length of nearly and no more than 360 degrees and the cylindrical surface of the other of said members being formed with a single helical groove having a length of nearly and no more than 360 degrees and being arranged to threadingly receive said projection to hold said members together in said operative relationship when said body member is inserted into said open rearward end of said housing member and rotated approximately 360 degrees to place substantially the full length of said projection within the full length of said groove, said groove being defined by rearwardly and forwardly facing side surfaces in facing relation to each other, and said other of said members being formed by separate forward and rearward parts with said rearwardly facing side surface being formed on said forward part and said forwardly facing side surface being formed on said rearward part.

4,407,554

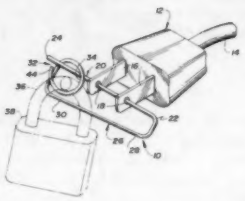
ELECTRICAL PLUG SAFETY DEVICE

Jerry E. Drall, 5167 Patrick Dr., West Bloomfield, Mich. 48033

Filed Mar. 16, 1981, Ser. No. 244,512

Int. Cl.³ H01R *13/44*

U.S. Cl. 339—37 **4 Claims**



1. An electrical plug safety device for use with an electrical plug having prongs including openings, the safety device comprising: a clasp including an elongated pin having an electrically nonconductive outer surface; said pin including an attached end and a distal end that can be inserted through the prong openings of the electrical plug; said clasp also including an elongated connector having one end that supports the attached end of the pin for movement of the pin between open and closed positions; said connector also having another end including a retainer formed to receive the distal end of the pin in the closed position thereof so as to prevent use of the electrical plug with the pin extending through the prong openings thereof; said pin being movable to the open position free from the retainer to allow withdrawal thereof from the prong openings such that the plug can be used; and said retainer having an opening capable of receiving a shackle of a lock to prevent movement of the pin to the open position and thereby selectively ensuring nonuse of the plug under control of the lock.

4,407,555

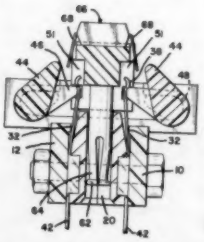
CAM ACTUATED DIP TEST SOCKET

Joseph L. Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 19, 1981, Ser. No. 245,303

Int. Cl.³ H01R *13/193*

U.S. Cl. 339—75 M **8 Claims**



5. A test socket for testing electrical components having a series of electrical terminals extending outwardly from respective sides thereof, comprising:

housing means having rows of spring terminal means secured along respective sides;

transport means mounted onto said housing means between said rows of spring terminal means and being movable relative to said housing means, said transport means having support surface means onto which an electrical component can be placed with the series of electrical terminals

thereof being disposed in alignment with respective spring terminal means of said rows of spring terminal means;

dielectric terminal-engaging means;

mounting means provided by said terminal-engaging means and said housing means mounting said terminal-engaging means onto said housing means along said rows of spring terminal means and for movement of the terminal-engaging means relative to said housing means; and

means pivotally connecting said terminal-engaging means to said transport means so that when said transport means is moved relative to said housing means with an electrical component on said support surface means, said pivotally connecting means moves said terminal-engaging means relative to both said housing means and transport means thereby causing the electrical terminals of the electrical component to be moved into electrical engagement with said spring terminal means.

4,407,556

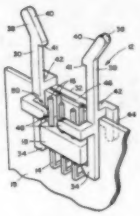
RETAINING CLIP FOR AN ELECTRICAL CONNECTOR

Albert M. Hoschett, Arlington Heights, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Sep. 21, 1981, Ser. No. 304,297

Int. Cl.³ H01R *13/627*

U.S. Cl. 339—91 R **2 Claims**



1. A retaining clip (12) for releasably holding an electrical connector socket (22) in engagement with a plug (14) securely soldered to a circuit board (19) having first and second surfaces; the plug (14) comprises at least two spaced parallel pins (16) maintained in relative position by a molded strip (18), the pins (16) are bent at right angles with one end of each pin soldered to the circuit board (19) and the free corresponding ends of the pins (16) being in a plane parallel to the first surface of the circuit board (19), said retaining clip (12) comprises:

a pair of generally parallel, elongated legs (30) having first and second ends, each of said legs (30) being spaced apart approximately the width of said plug (14),

a brace (32) secured to each of said legs (30) spaced apart from both ends thereof and serving to hold said legs (30) in substantially parallel alignment,

said first ends of said legs (30) each having a locking prong (34), said locking prongs (34) being oppositely positioned to grasp the molded strip (18) of said plug (14),

said second ends of said legs (30) having notches (41), oppositely disposed and serving to engage the socket (22) to prevent disengagement of the socket (22) from the plug (14),

said second end of each of said legs (30) is flared (38) forming a camming surface (40) which serves to facilitate movement of said legs (30) apart to allow engagement between said socket (22) and said plug (14), and

said brace (32) includes a pair of arms (44) secured to said legs (30) and extending in a common direction substantially along a line parallel to the axis of each of the legs (30) and along a second surface of the circuit board (19) and serving to restrict relative movement between said retaining clip (12) and said circuit board (19).

4,407,557

ELECTRICAL COUPLING DEVICE

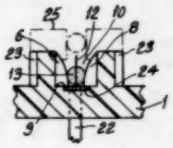
Derek Hayes, Home Farm Cottage, St. Michael, Bungay, Suffolk NR 1NF, England

Filed Jul. 14, 1981, Ser. No. 283,235

Claims priority, application United Kingdom, Jul. 16, 1980, 8023304

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—97 R **13 Claims**



1. An electrical coupling device for effecting electrical connection between an electrically-conducting member of the coupling device and the electrically-conducting material of an insulated electrical conductor, said coupling device comprising

a base member of electrically insulating material,

a cradle provided on the base member,

said cradle including a pair of spaced-apart, metallic side members having respective first ends joined to each other by metallic connection means, said side members and said connection means together defining an internal space of the cradle which is open between respective second ends of said side members to enable said conductor, in use of the coupling device, to be pressed into said space between said side members, and

a metallic, conductor-piercing means, forming at least part of said electrically-conducting member, which conductor-piercing means projects into said space between said side members in the direction from said first ends of said side members toward said second ends thereof,

whereby when said conductor is introduced into said space, said conductor-piercing means penetrates the electrically-insulating material of the conductor to make contact with the electrically-conducting material of the conductor and the conductor is subjected to pressure between said side members of the cradle.

4,407,558

ELECTRICAL CONNECTOR ASSEMBLIES FOR CAPACITIVE FLUID-GAUGING PROBES

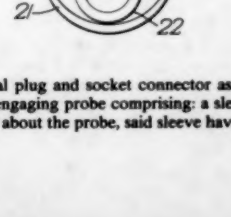
Peter R. Thrift, Basingstoke, England, assignor to Smiths Industries Public Limited Company, London, England

Filed May 4, 1981, Ser. No. 260,461

Claims priority, application United Kingdom, May 13, 1980, 8015814

Int. Cl.³ H01R *13/516, 13/635*

U.S. Cl. 339—121 **9 Claims**



1. An electrical plug and socket connector assembly for a capacitive fluid-engaging probe comprising: a sleeve which is shaped to extend about the probe, said sleeve having a portion

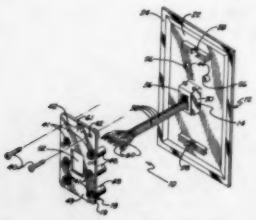
which is remote from said probe, said remote portion of said sleeve having an inner surface which is provided with a configuration of axially extending surface formations; an inner member separate from said sleeve and probe and shaped to be received within said sleeve between said portion of the sleeve and the probe, said inner member having an outer surface which is spaced from said probe and provided with a configuration of axially extending surface formations, the said outer surface of said inner member being disposed in spaced facing relation to the said inner surface of said sleeve to define therebetween a plurality of axially extending socket members which are demarcated from one another by axially extending surface formations on at least one of said inner surface of said sleeve and said outer surface of said inner member, each of said socket members having two opposing sides which are defined respectively by a part of said inner surface of said sleeve and by a part of said outer surface of said inner member, the surface configurations of said opposing sides of each said socket member being defined by said axially extending surface formations on said parts, the said surface configurations of the opposing sides of at least some of said socket members differing from one another; a plurality of first contact elements; means mounting one each of said first contact elements in respective different ones of said socket members; a plurality of separate plug members each of which is adapted to be individually inserted into one of said socket members independently of the insertion of any other of said plug members into any other of said socket members, each said plug member having an outer housing containing a single second contact element that is positioned to engage the one of said first contact elements in the socket member into which said plug member is inserted, the housing of each of said plug members having a pair of opposing sides adapted to be disposed in facing slideable relation to the said opposing sides of the socket member into which said plug member is inserted, the said opposing sides of each said plug member housing having configurations of axially extending surface formations respectively shaped for cooperation with the surface configurations in the said opposing sides of the said socket member into which said plug member is slideably inserted, the said surface configurations of the opposing sides of the housing of at least one of said plug members differing from the said surface configurations of the opposing sides of at least one of said socket members such that said at least one of said plug members is prevented from being inserted into said at least one of said socket members.

4,407,559

CONNECTOR DEVICE WITH FLUSH MOUNTING RECEPTACLE, COVER PLATE AND TERMINAL BOARD

Daniel Meyer, Rochester, Minn., assignor to Communications Systems, Inc., Hector, Minn.

Filed Apr. 9, 1981, Ser. No. 252,287
Int. Cl.³ H01R *13/514*
U.S. Cl. 339—126 R **10 Claims**



1. A connector device for receiving an electrical communication plug and which mounts flush on a surface having a cavity therein and with a rear side facing the cavity, the device comprising:

a cover plate having at least one opening therethrough and a periphery circumscribing a rear side for adjacently abutting the surface;

means for attaching the cover plate to the surface;

at least one housing having a receptacle defined therein attached to the cover plate, said housing having a plug receiving end and a rearward end, the plug receiving end being aligned with the opening of the cover plate for cooperation therewith and the rearward end extending into the cavity, the receptacle having first conductive means for conductively contacting the communication plug inserted into the plug receiving end and a second conductive means conductively connected to the first conductive means; and

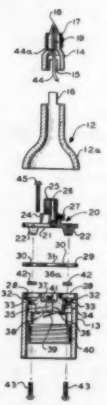
a terminal board positioned on the rear side of the cover plate having a base with a plurality of conductive terminals on the base conductively connected to the second conductive means, and having a plurality of supports projecting from the base toward the cover plate supporting the base from the rearside of the cover plate, and wherein said base is fastened with respect to the cover plate with threaded fasteners substantially less in number than the number of terminals and wherein at least one of the conductive terminals is a threaded fastener that threadably fastens the base to the rearward end of the receptacle.

4,407,560

ELECTRICAL ADAPTER

Michael Williams, R.D. #3 Box 222, Quakertown, Pa. 18951

Filed Jun. 25, 1981, Ser. No. 277,127
Int. Cl.³ H01R *13/504*
U.S. Cl. 339—154 L **9 Claims**



1. An adapter comprising:

(a) a top section comprised of a hollow ceramic base member having upwardly extending protrusions and a hollow ceramic top member having notched portions corresponding to said protrusions, said upwardly extending protrusions engaging said notched portions to form joints, said joints being secured by an adhesive

(b) a male threaded screw shell and a central contact mounted on said top member; and

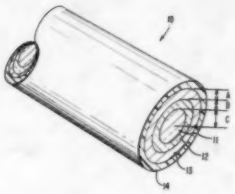
(c) a bottom ceramic section connected with said base member having mounted thereon an internally threaded female screw shell and a central contact, said central contact mounted on said top member and said central contact mounted on said bottom ceramic section being electrically connected and said male threaded screw shell and said female threaded screw shell being electrically connected.

4,407,561

METALLIC CLAD FIBER OPTICAL WAVEGUIDE

Joseph A. Wysocki, Oxnard, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 14, 1980, Ser. No. 196,955
Int. Cl.³ G02B 1/10, 5/14, 5/172
U.S. Cl. 350—96.3 17 Claims



1. A flexible fiber optical waveguide for the transmission of optical electromagnetic radiation, said waveguide comprising a glass fiber including a glass core member having a first minimum refractive index for said radiation and a glass cladding concentrically surrounding said core, said glass cladding including at least one layer having a second refractive index for said radiation which is lower than the minimum of said first refractive index by at least 0.1% to produce total internal refraction of said optical radiation at the core/clad interface and to thereby guide said optical radiation along said waveguide, characterized in that said glass fiber is provided with a coating of a metal or alloy of sufficient thickness to substantially preserve the nascent strength of said glass fiber waveguide without substantially interfering with the optical transparency of said waveguide or the flexibility thereof, and said metal or alloy

(a) is substantially chemically inert with respect to the material comprising said glass fiber at the melting point of said metal or alloy during coating of said metal or alloy onto said glass fiber;

(b) has a recrystallization temperature greater than room temperature or the anticipated working temperature, whichever is greater; and

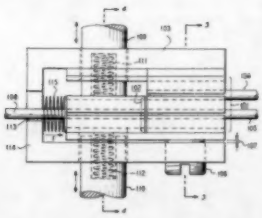
(c) forms an hermetic seal around the outer surface of said glass cladding.

4,407,562

OPTICAL FIBER SWITCH

William C. Young, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 210,013, Nov. 24, 1980, abandoned.
This application Oct. 1, 1982, Ser. No. 432,254
Int. Cl.³ C02B 7/26
U.S. Cl. 350—96.20 13 Claims



1. A switch for coupling an optical signal between optical fibers characterized by

first (101) and second (102) housings having a number of fiber receiving channels (301) therethrough, each housing also having two parallel exterior surfaces with a number of grooves (204) having a uniform cross-section disposed therein, the perpendicular distance between said surfaces of said first housing being greater than the perpendicular distance between said surfaces of said second housing;

first (104, 105) and second (108) sets of optical fibers respectively disposed in said fiber receiving channels in said first and second housings;

a support assembly (103, 106, 205) having a slot with grooved and parallel sidewalls which are the mating opposite of the grooved exterior housing surfaces, said first housing being fixedly positioned in said slot by the mutual engagement of the grooved exterior surfaces of said first housing and said grooved slot sidewalls, said second housing being disposed in said slot adjacent said first housing with said first and second sets of optical fibers parallel to one another; and

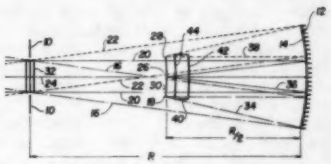
means (109, 110) for displacing said second housing in a direction substantially perpendicular to said exterior surfaces to either of two positions which axially aligns a predetermined number of optical fibers in said first and second sets, each position being precisely determined by the mutual engagement of one grooved exterior housing surface and one grooved slot sidewall.

4,407,563

HIGH SPEED MULTI FOCAL PLANE OPTICAL SYSTEM

Peter O. Minott, Bowie, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 22, 1981, Ser. No. 333,535
Int. Cl.³ G02B 27/10, 17/08
U.S. Cl. 350—173 17 Claims



1. A pupil concentric optical imaging system comprising:

an aperture stop (10);

an image forming objective including a first optical element (12) concentric with said aperture stop (10) and adapted to converge a light beam (16) impinging thereon from said aperture stop, and

a second optical element (40) situated in the path of said converging beam (34) from said first optical element (12), said second optical element (40) including an entrance face (42) and at least two exit faces (44, 54) from which images emerge to at least two focal surfaces (30, 56), said entrance and exit faces (42, 44, 54) being curved and optically concentric to said aperture stop (10).

4,407,564

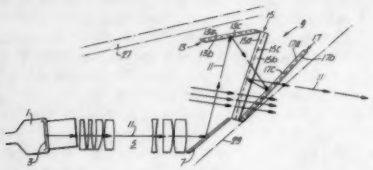
HEAD-UP DISPLAYS

Stafford M. Ellis, East Preston, England, assignor to Elliott Brothers (London) Limited, Essex, England

Filed Jan. 21, 1981, Ser. No. 237,401
Claims priority, application United Kingdom, Jan. 22, 1980, 8002127
Int. Cl.³ G02B 27/14, 5/32; G03H 1/30
U.S. Cl. 350—174 6 Claims

1. A display unit for a head up display comprising a combiner through which an observer can view a scene and a projector unit having a display surface from which light representing a display is projected onto the combiner for reflection to the observer thereby to provide the observer with an image of the display superimposed on his view through the combiner,

characterised in that the combiner has first, second and third tuned reflective optical films which converge towards one another so as to define a pair of tapering spaces; the reflection/-transmission characteristics of the films and the angles of convergence of the films and their angular relationship with the display surface being such that light within a narrow wave-



band from the display surface is, in turn, reflected at the first film towards the second film, transmitted through the second film towards the third film, reflected at the third film back towards the second film, reflected at the second film towards the third film, and transmitted through the third film to the observer's viewing position.

4,407,565

LIGHT VALVE SUSPENSION CONTAINING FLUOROCARBON LIQUID

Robert L. Saxe, New York, N.Y., assignor to Research Frontiers Incorporated, Plainview, N.Y.

Filed Jan. 16, 1981, Ser. No. 252,757
Int. Cl.³ G02F *1/01*
U.S. Cl. 350—374 **26 Claims**

1. In a light valve, comprising a cell containing a suspension of particles in a liquid suspending medium, the improvement wherein said light valve suspension comprises particles of a perhalide of an alkaloid acid salt or of a light-polarizing metal halide or perhalide suspended in said liquid suspending medium and a protective polymer effective to inhibit agglomeration of said particles dissolved in said liquid suspending medium, said liquid suspending medium comprising an electrically resistive, chemically inert, low molecular weight, liquid fluorocarbon polymer having a specific gravity at room temperature of at least about 1.5 and having at least about 50% of its atoms constituted by halogen atoms, at least 60% of said halogen atoms being fluorine and the balance chlorine and/or bromine, and an electrically resistive organic liquid miscible with the fluorocarbon liquid, said fluid suspending medium being operable to suspend said particles in substantial gravitational equilibrium.

4,407,566

OPTICAL FILTER

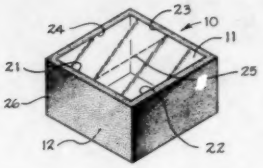
William J. Rosenberg, and Alan M. Title, both of Palo Alto, Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Sep. 29, 1981, Ser. No. 306,691
Int. Cl.³ G02B *5/28, 5/30*
U.S. Cl. 350—404 **19 Claims**

1. A filter element for an optical filter, said filter element comprising:

(a) a birefringent crystal having a unique optic axis; said crystal having a rectangular parallelopiped configuration with an entrance face through which optical energy is received, an exit face through which optical energy in a particular passband is passed, and four side walls; said optic axis being parallel to said entrance and exit faces, each of said side walls being surfaced so as to cause optical energy incident upon any one of said side walls from within said crystal at an angle greater than a critical angle as measured from normal to said one of said side walls to undergo total internal reflection back into said crystal; and

(b) a coating on each of said side walls, said coating having an index of refraction such as to cause said critical angle for total internal reflection of optical energy in said pass-



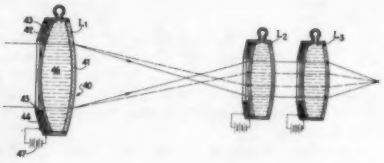
band to be substantially equal to a half-angle defining a maximum field of view for said filter element.

4,407,567

OBJECTIVE HAVING A VARIABLE FOCAL LENGTH

Guy A. Michelet, Paris, and Georges G. Bret, Verrieres, both of France, assignors to Quantel S.A., Orsay, France

Filed Apr. 24, 1979, Ser. No. 32,932
Claims priority, application France, May 5, 1978, 78 13395
Int. Cl.³ G02B *15/00*
U.S. Cl. 350—423 **16 Claims**



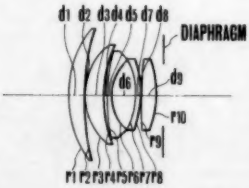
1. An optical device having a variable focal length comprising at least two separate and independent optical elements which are of variable focal length spaced apart at a distance sufficient to produce an optical instrument having variable magnification and comprise piezoelectric multilayer structures, at least one electric supply connected to the multilayer structures, and electronic means for controlling the voltage supplied to the respective multilayer structures of the elements of variable focal length as a function of the magnification desired for said optical device.

4,407,568

LARGE APERTURE OBJECTIVE WITH BEHIND THE LENS DIAPHRAGM

Hideo Yokota, Tokyo, and Sadahiko Tsuji, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1980, Ser. No. 155,757
Claims priority, application Japan, Jun. 7, 1979, 54-71740
Int. Cl.³ G02B *9/60*
U.S. Cl. 350—467 **5 Claims**



1. A large aperture objective with a behind the lens diaphragm comprising five components of which the first and the

second counting from the front are positive meniscus lenses of convex surface toward the front, the third is a negative meniscus lens of concave surface toward the rear, the fourth is a negative meniscus lens of concave surface toward the front, and the fifth is a bi-convex lens with its rear surface of strong curvature toward the rear, said diaphragm being positioned on the image side of said fifth lens and said objective satisfying the following conditions:

(1) $0.18\ f<D_1<0.28\ f$, where $D_1=d_1+d_2+d_3+d_4+d_5$

(2) $0.08\ f<D_2<0.18\ f$, where $D_2=d_7+d_8+d_9$

(3) $0.12\ f<d_6<0.15\ f$

(4) $0.35<(R_1/R_2)<0.5$

(5) $0.6<(R_7/R_8)<0.8$

(6) $|R_{10}/R_9|<0.3$

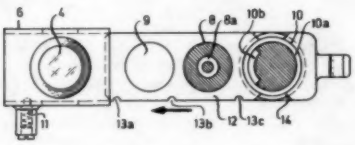
wherein R_i is the radius of curvature of the i-th lens surface counting from the front; di is the axial thickness or air spacing between the i-th and (i+1)th lens surfaces; and f is the focal length of the entire lens system.

4,407,569

DEVICE FOR SELECTIVELY AVAILABLE PHASE-CONTRAST AND RELIEF OBSERVATION IN MICROSCOPES

Horst Piller, Aalen, and Klaus Weber, Konigsbronn, both of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,072
Int. Cl.³ G02B *21/14*
U.S. Cl. 350—509 **13 Claims**



1. In a microscope, illumination-optical means establishing an illumination-ray path, an objective and observation-optical means establishing an observation-ray path, a first pupil plane in the illumination-ray path conjugate to a second pupil plane in the observation-ray path, a phase-contrast layer positioned in said second pupil plane, said phase-contrast layer having the configuration of at least one circular annulus concentric with the axis of the observation-ray path at said second pupil plane, the outer diameter of said annulus being of effectively pupil-entrance size at said second plane, and selectively operable means including at least two diaphragms of different configuration at said first pupil plane, one of said two diaphragms having the shape of a circular annulus, and the other of said two diaphragms being a light transmitting circular-ring segment.

4,407,570

SPECIMEN HOLDING DEVICE FOR MICROSCOPE STAGES

Toshimi Hayasaka, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Mar. 16, 1981, Ser. No. 244,073
Claims priority, application Japan, Mar. 17, 1980, 55/35486
Int. Cl.³ G02B *21/26*
U.S. Cl. 350—529 **5 Claims**

1. A specimen holding device for a microscope stage, comprising:

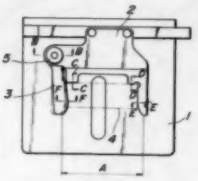
a specimen supporting body secured to the microscope stage;

a specimen push claw rotatably mounted on said specimen supporting body, movable between an open and closed position, and biased toward said closed position;

a three sided cavity having a base defined by said body, a first side, and a second side defined by said push claw;

the end of said first side being provided with an outwardly inclined surface, completely nonrotatable with respect to said first side;

the end of said push claw being provided with an outwardly inclined surface in the closed position, completely nonrotatable with respect to said push claw, said inclined surface defining an entrance to the cavity which narrows in width from the entrance toward the base, whereby a specimen moving towards said base can contact said inclined surfaces and cause said claw to rotate to an open position; wherein the edges of said first side and said push claw adjacent said cavity are downwardly inclined along their entire lengths to provide gripping means for gripping a specimen.

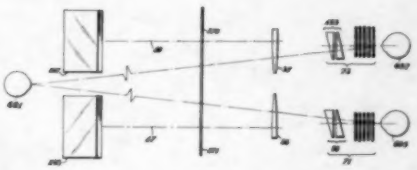


4,407,571

COMPACT REFRACTION INSTRUMENT

Peter Augusto, Hilton; Edwin A. Hazard, and Richard C. Mohrman, both of Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 11, 1980, Ser. No. 177,142
Int. Cl.³ A61B *3/02*
U.S. Cl. 351—13 **42 Claims**



1. A refraction instrument having alignment, retinoscopy, distance and near vision testing modes, said instrument comprising:

(a) housing means;

(b) target means supported by said housing means, said target means including at least one binocular target having first and second halves;

(c) first and second optical means, supported by said housing means, for making said target means appear at or near infinity when said target means is viewed through said optical means, said optical means and said target means defining first and second optical paths;

(d) first and second sets of corrective optics for emulating a series of ophthalmic prescriptions, said corrective optics supported relative to said housing means in optical alignment with said optical means;

(e) means, supported by said housing means and interposed along said optical paths between said optical means and said target means for separating said optical paths so as to provide separate and independent views of said halves of said binocular target;

(f) means, supported by said housing means, for suppressing accommodation; and

(g) mode change apparatus, supported by said housing means between said optical means and said target means,

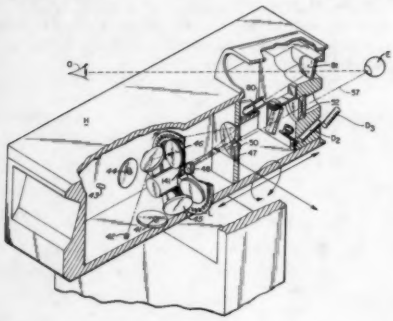
said apparatus including first and second alternate means for folding said optical paths, said first folding means folding said optical paths when said instrument is used in said distance and near vision testing modes, said second folding means folding said optical paths when said instrument is used in retinoscopic examination mode, said second folding means including means which permit retinoscopic examination through said optical means and said corrective optics while simultaneously maintaining separate and independent views of said halves of said binocular target through said optical means and said corrective optics.

4,407,572

KERATOMETER

William E. Humphrey, San Leandro, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed Jun. 12, 1980, Ser. No. 158,849
Int. Cl.³ A61B *3/10*
U.S. Cl. 351—212 **23 Claims**



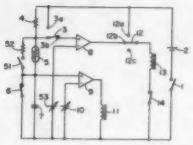
1. A keratometer for measuring by reflection curvature of an optical surface including at least one light emitting area, a corresponding photodetection area with a separate optical path between said light emitting area and said photodetection area; said path between said two areas having a portion thereof running substantially adjacent to the optical axis of said keratometer, one of said areas including first and second photo distinct portions; means for positioning the optical surface with curvature substantially coaxial to the optical axis of said keratometer to define a virtual image of said light emitting area, said light path at said portions substantially adjacent to the optical axis incident to said optical surface with curvature; a moving boundary locus for occulting light between said light emitting and detection areas, said locus including a transparent portion, an opaque portion, and at least one boundary therebetween for occulting light by movement of said boundary between said light source and detector whereby timing of said occultations of said first portion relative to said second portion of one of said areas by said moving boundary locus enables detection of the movement of the weighted center of illumination of said areas to determine towards and away positioning of said optical surface along the optical axis for measurement of said optical surface in at least sphere and cylinder curvatures.

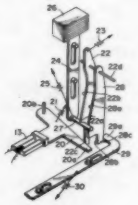
4,407,573

POP UP FLASH DEVICE CONTROL FOR A CAMERA

Hiroshi Wakabayashi, Yokohama; Kazuyuki Kazami, Tokyo; Yoshiaki Ohtsubo, Kawasaki, and Shigeo Akasaka, Kodaira, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 21, 1981, Ser. No. 266,103
Claims priority, application Japan, Jun. 5, 1980, 55-77298[U]; Jun. 8, 1980, 55-95196[U]
Int. Cl.³ G03B *7/16*
U.S. Cl. 354—33 **10 Claims**





1. A camera having a flash device provided with a light emitting portion which is movable between a first position in the camera and a second position protruded from the camera, and first biasing means for biasing said light emitting portion from the first position to the second position, the camera further comprising:

a latch member movable between a first position in which the latch member is capable of latching the light emitting portion in order to inhibit the light emitting portion from being moved from the first to the second position thereof by said biasing means when the light emitting portion is in the first position thereof, and a second position in which the light emitting means is released from the latch member;

second biasing means for biasing the latch member from the second to the first positions thereof;

an operating member movable between a first position in which the operating member can fix the latch member to the second position thereof while engaged with the latch member and a second position in which the operating member releases the latch member therefrom;

third biasing means for biasing said operating member from the second to the first position thereof;

holding means having a first state in which said operating member is held in the second position thereof and a second state in which said operating member is released; and

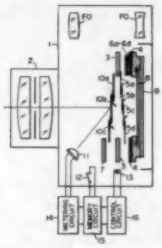
means for re-setting said operating member and said holding means to said second position and said first state, respectively, in response to movement of said light emitting portion from said first to second position.

2. A camera as set forth in claim 1, further comprising a detecting circuit for detecting the luminance value of light from the object to be photographed and producing a detecting signal when the luminance value is less than a predetermined value which is required to effect a proper exposure with respect to film charged in the camera, and wherein said flash device is capable of emitting flash light by the light emitting portion in association with the camera when the flash light emitting portion is in the second position; and said holding means when it is in the first state, changes to the second state in response to said detecting signal.

4,407,574
CAMERA WITH FOCAL PLANE SHUTTER

Naoki Tomino, Kawasaki, and Masaaki Tsukamoto, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 340,842, Jan. 20, 1982, abandoned, which is a continuation of Ser. No. 154,869, May 30, 1980, abandoned. This application Sep. 15, 1982, Ser. No. 418,292
Claims priority, application Japan, Jun. 9, 1979, 54-71846
Int. Cl.³ G03B 7/089, 9/36, 19/12
U.S. Cl. 354—50 23 Claims



15. In a camera having a focal plane shutter of the type which comprises a group of opening blades and a group of closing blades for opening and closing the exposure aperture of said camera wherein each blade is responsible for covering each corresponding area of the aperture and all the blades in each group together can cover the whole area of the aperture, and a light receiving element for metering the light transmitted through the photographing lens of said camera, the improvement comprising:

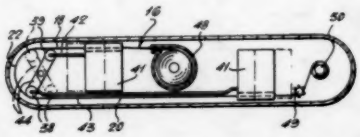
(a) a light shielding member provided in the photographing light path adjacent to said focal plane shutter for shielding at least a boundary area between neighboring blades in said opening group relative to said transmitted light and disposed to reflect the photographing light toward said light receiving element, said light shielding member including a plural number of light shielding plates adapted to overlap each other; and

(b) means for displacing said light shielding plates relative to each other to retract them to a position out of said photographing light path before exposure.

4,407,575
STEREOSCOPIC PHOTOGRAPHY

Hon Liu, 200 Aberdeen Main Rd., 5th Floor, Rear Portion, Hong Kong, Hong Kong

Filed Nov. 23, 1981, Ser. No. 323,790
Claims priority, application United Kingdom, Nov. 24, 1980, 8037617
Int. Cl.³ G03B 35/08
U.S. Cl. 354—115 16 Claims

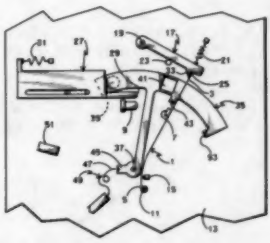


10. A camera for exposing a stereoscopic pair of images, said camera comprising: means for holding a length of film in the form of a loop comprising two substantially flat arms and a bent portion spacing and joining said arms where the film is bent through 180°; two optical systems, one for recording a left-hand image and one for recording a right-hand image, said left-hand optical system being arranged to record the left-hand image on one arm of the film adjacent one edge thereof and the right-hand optical system being arranged to record the right-hand image on the other arm adjacent the other edge thereof, means to vary the spacing between the axes of the two optical systems and to move the position of said bent portion of film to maintain the spacing substantially constant between the left-hand and right-hand images on the film as measured along the loop, and means for advancing the film between exposures along one arm, around the bent portion and along the other arm.

4,407,576
SYNCHRONIZING MECHANISM FOR FLASH FIRING AND SHUTTER OPERATION

Brian J. Joseph, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 8, 1982, Ser. No. 337,928
Int. Cl.³ G03B 15/03
U.S. Cl. 354—135 4 Claims



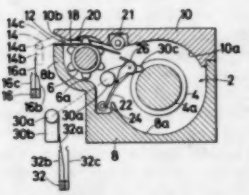
1. In a photographic camera of the type wherein (a) a piezoelectric generator is struck to produce an electrical pulse for flash firing, (c) a striker is movable to strike said generator, and a shutter member is operable to initiate a film exposure in synchronization with flash firing, the improvement comprising:

means, adapted to releasably engage said striker with said shutter member, for moving said shutter member with said striker and for allowing said shutter member to be catapulted from said striker upon the striker striking said piezoelectric generator, whereby said shutter member is operated to initiate a film exposure.

4,407,577
AUTOLOADING APPARATUS FOR PHOTOGRAPHIC FILM

Ikushi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Toyonaka, Japan

Filed Jan. 5, 1982, Ser. No. 337,225
Claims priority, application Japan, Jan. 8, 1981, 56-1761
Int. Cl.³ G03B 1/12
U.S. Cl. 354—173 6 Claims



1. An autoloading apparatus comprising:

a spool chamber having a film inlet,

a take-up spool accommodated in the spool chamber for winding a film thereon,

a film transport member for transporting the film to the take-up spool after the film is inserted into the film inlet of the spool chamber,

a motor for driving the take-up spool and the transport member,

a motor drive circuit for energizing the motor,

first detecting means for detecting the insertion of the film into the film inlet, associated with the motor drive circuit for causing the motor drive circuit to energize the motor upon the insertion of the film into the film inlet, and

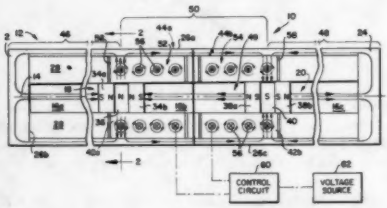
second detecting means for detecting that the film has been wound on the take-up spool, associated with the motor drive circuit for causing the motor drive circuit to de-energize the motor upon the winding of the film on the take-up spool.

4,407,578

EFFICIENT ELECTROMAGNETIC ACTUATOR USABLE AS PHOTOGRAPHIC SHUTTER

Christian C. Petersen, Westwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 3, 1982, Ser. No. 374,503
Int. Cl.³ G03B 9/08; H02K 33/18
U.S. Cl. 354—235 **5 Claims**



1. An electromagnetic actuator comprising:

a core assembly including a plurality of pairs of permanent magnets aligned along a given axis, each of said pairs of magnets having like magnetic poles facing each other and opposite magnetic poles facing away, and said pairs of magnets being spaced apart along said given axis with means providing a continuous low magnetic reluctance path therebetween and with opposite poles of adjacent pairs facing each other to thereby produce regions of high density magnetic lines of flux of opposite polarity extending generally transversely of said given axis from adjacent pairs;

means for defining a continuous low reluctance path extending alongside said core assembly from the magnetic pole forming one end of said core assembly to the magnetic pole forming the other end thereof and spaced over said regions of high density magnetic lines of flux so as to define magnetic gaps to said core in the area of said regions;

electrical conductor arrangements supported within the magnetic gaps associated with each of the regions of high density magnetic flux for translational movement generally parallel to said given axis with respect to said core assembly; and

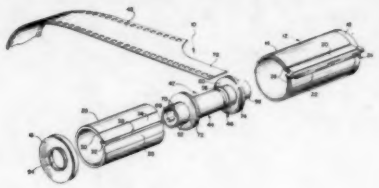
means for coupling each of said electrical conductor arrangements to a voltage source for producing a force effecting relative movement generally parallel to said given axis between said electrical conductor arrangements and said core assembly.

4,407,579

PHOTOGRAPHIC FILM ASSEMBLAGE

Joseph F. Huff, Hyde Park, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 3, 1982, Ser. No. 374,504
Int. Cl.³ G03B 17/26
U.S. Cl. 354—275 **8 Claims**



1. A photographic film assemblage comprising:

a cassette having means defining a lighttight passageway through which a strip of photographic film is adapted to be advanced to the exterior of said cassette;

a roll of photographic film having a leading and trailing end; and

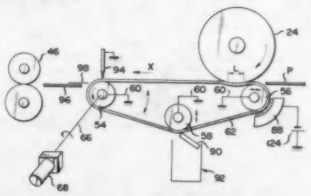
a spool rotatably supported within said cassette with said roll of film coiled around said spool and with said trailing end being attached to said spool, said spool having a longitudinal axis and being comprised of first and second members connected to each other for movement relative to each other along said longitudinal axis, each of said first and second members includes a radially extending flange having friction producing means on a face thereof which is adapted to lie in a plane closely adjacent to a side of said roll of film, each of said first and second members further includes means extending to the exterior of said cassette where they may be manually grasped and moved toward each other thereby moving said friction producing means on said flanges into firm engagement with the opposite sides of said roll of film whereby relative rotation between said spool and said cassette about said longitudinal axis in a predetermined direction is then effective to move said leading end of said roll of film into and through said lighttight passageway.

4,407,580

TRANSFER DEVICE

Shinichi Hashimoto, Fujisawa; Toshimasa Takano, Sagamihara, and Hideo Mukai, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 27, 1981, Ser. No. 257,613
Claims priority, application Japan, Apr. 30, 1980, 55-57540; Apr. 30, 1980, 55-57541; Apr. 30, 1980, 55-57542
Int. Cl.³ G03G 15/14, 15/16
U.S. Cl. 355—3 TR **17 Claims**



1. In a transfer device for an electrostatic copying apparatus including an image forming body on which a toner image made of a toner charged with a predetermined polarity is formed, comprising:

a transfer belt adapted to be run in a manner to face the

image forming body and holding a copying medium relative to the image forming body;

a plurality of rollers rotatably mounted and supporting the transfer belt such that the belt can be run; and

a charger for causing that surface of the transfer belt which is located on the image forming body side to be charged with a polarity opposite to said predetermined polarity,

the improvement in which said transfer belt includes:

a first layer formed on the side at which it faces said image forming body and formed of a material having a resistivity of above 10^{10} Ωcm; and

a second layer formed on the side opposite to that on which said image forming body is provided, and formed of a material having a resistivity lower than said resistivity of said first layer;

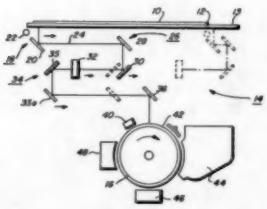
said charger including a contact member formed of a pliable material, having a predetermined resistivity and contacting the surface of said first layer to form a surface potential on the surface of said first layer, an electrode connected to the contact member and having a resistivity lower than that of said contact member, and means for supplying a voltage on the electrode to charge said first layer and at least one of said rollers is made of an electroconductive material, contacting the surface of said second layer and grounded.

4,407,581

COMPACT OPTICAL SCANNING SYSTEM

David K. Shogren, Ontario, and Robert G. Zambelli, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 17, 1982, Ser. No. 378,691
Int. Cl.³ G03G *15/28*
U.S. Cl. 355—8 **8 Claims**



1. A multi-rate scanning system for scanning a document lying in an object plane and projecting an image along an optical path onto a photoreceptor plane, said system including the following optical elements:

an illumination/mirror scanning assembly including a first reflective means associated with the illumination means and adapted for movement in the scan direction at a velocity V1 and a second reflective means adapted for movement in the scan direction at a velocity V2;

a projection lens lying in a plane parallel to said illumination/mirror assembly and adapted to move in the scan direction at a velocity V3;

a third reflective means adapted to move in the scan direction at a velocity V4; and

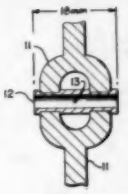
a drive arrangement for driving said optical elements at a velocity relatively whereby $V1>V2>V3>V4$.

4,407,582

METHOD AND APPARATUS FOR REDUCTION OF MATRIC INTERFERENCE IN ELECTROTHERMAL ATOMIZER FOR ATOMIC ABSORPTION SPECTROSCOPY

Ray A. Woodriff, Bozeman, Mont., assignor to The Research and Development Institute, Inc. at Montana State University, Bozeman, Mont.

Filed Jan. 12, 1981, Ser. No. 224,627
Int. Cl.³ G01N *21/74*
U.S. Cl. 356—312 **5 Claims**



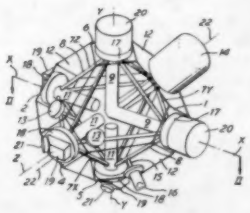
1. In a method for sample analysis by atomic absorption spectroscopy wherein a chemical sample is atomized by pulsed electrothermal energy from a carbon rod atomizer containing graphite electrode support holders and a graphite furnace tube, the improvement according to which the ends of the sample-containing furnace tube are heated first by passing electrical current only through said ends followed by heating the center of the furnace tube by conduction thereby providing sufficient thermal energy for complete decomposition of the sample molecules to the atomic state.

4,407,583

RING LASER GYROSCOPES

Graham J. Simms, Reading, England, assignor to British Aerospace Public Limited Company, London, England

Filed Apr. 17, 1981, Ser. No. 255,018
Claims priority, application United Kingdom, May 9, 1980, 8015477
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **8 Claims**



1. A ring laser gyroscope having a plurality of sensitive axes and hence a plurality of cavities, the cavities lying in mutually orthogonal planes at right angles to the respective sensitive axes and each cavity having three or more corners arranged so that at least one corner coincides with a corner of another cavity, whereby the cavities are interconnected, the gyroscope further comprising a plurality of mirrors disposed respectively at the coinciding corners and the remaining corners of the cavities, whereby the number of mirrors is less than the total number of cavity corners, the mirrors at the coinciding cavity corners and the coinciding cavities being oriented such that the normal to each of these mirrors lies in the plane of each cavity it serves and bisects the associated corners of those cavities.

4,407,584

VESSEL LID ESPECIALLY FOR A MIXER USED FOR THE HOMOGENIZATION OF A MIXTURE OF PRODUCTS

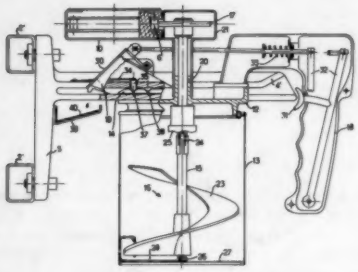
Daniel Boudin, Orleans; Claude Brachet; Pierre Desmier, both of St. Jean de la Ruelle; Pierre Foltier; Jean Godat, both of Olivet; Alain Krzywdziak, St. Denis en Val, and Daniel Parmenon, Orleans la Source, all of France, assignors to Fonderie et Ateliers des Sablons, France

Filed Jan. 29, 1981, Ser. No. 230,109

Claims priority, application France, Feb. 11, 1980, 80 02940

Int. Cl.³ B01F *7/16, 15/00*

U.S. Cl. 366—279 **14 Claims**



1. A lid which is to be attached to a vessel, said lid comprising:

a. a pouring spout;

b. a handle to allow the lid and attached vessel to be carried;

c. a support housing having two slides; and

d. means facilitating a fitting to said support housing designed to support the lid and an attached vessel, said means including two lateral support elements on opposite sides of the lid which fit said two slides on the support housing, said slides having a configuration complementary to that of the support elements, and means for adjusting said slides to enable the fitting therein of lids of various sizes.

4,407,585

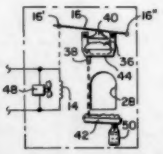
SCENT-AWAKE CLOCK

Louise D. Hartford, 391 Durant Ave., Staten Island, N.Y. 10308, and James P. Kavoussi, 1401 80th St., Brooklyn, N.Y. 11228

Filed Dec. 11, 1981, Ser. No. 330,030

Int. Cl.³ G04B *47/00*

U.S. Cl. 368—12 **7 Claims**



1. A scent-awake clock for awakening a sleeper through the sense of smell comprising a housing; aromatic means in said housing for giving off a scent when dispensed; means for storing and dispensing said aromatic means in said housing; actuating means operably connected to said means for storing and dispensing, said actuating means selectively causing said aromatic means to be dispensed form said means for storing and dispensing; and timing means for activating said actuating means at a predetermined time, said aromatic means comprising a liquid stored in said means for storing and dispensing said means for storing and dispensing comprising a container, said actuating means comprising a solenoid electrically connected to said means for activating, and a lever arm pivoted at one end thereof to said housing, the other end of said lever arm being connected to the plunger of said solenoid for movement thereby, said lever arm operating said means for storing and dispensing said aromatic means to thereby dispense said aromatic means, wherein said lever arm comprises a plunger means located between said one end and said other end thereof, said plunger means extending downwardly from said lever arm towards said container; said container comprising a sealed liquid-filled squeezable bag which is alternately squeezed and expanded by said plunger means to cause said aromatic means to exit therefrom, said squeezable bag having outlet means at the bottom thereof through which said aromatic means is forced out; means for mounting said squeezable bag in said housing; and tray means mounted in said housing directly below said outlet means so that when said aromatic means is forced out of said squeezable bag, said aromatic means drops onto said tray means where said aromatic means evaporated to give off a scent to awaken a sleeper; said housing further having an opening formed therein adjacent said tray means through which said evaporated aromatic means exits.

4,407,586

THIN WRIST-WATCH

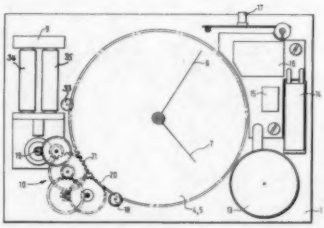
Jean-Pierre Musy, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Aug. 27, 1980, Ser. No. 181,928

Claims priority, application France, Sep. 4, 1979, 79 22607

Int. Cl.³ G04B *19/20*

U.S. Cl. 368—77 **7 Claims**

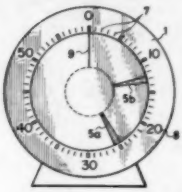


1. A wrist-watch of reduced thickness comprising a case, a crystal, at least two time indicating discs, a drive system arranged to drive said discs, said drive system itself being driven by an electric motor under control of an electronic circuit and wherein each of said indicator discs is formed from a single thin sheet of transparent material with teeth formed from this material on their periphery, said transparent material having a thickness between 0.05 mm and 0.15 mm, and each disc being driven from a common driving wheel which drives directly a first faster moving disc and indirectly a second slower moving disc via a gear train independent from the faster moving disc said discs being guided laterally at their periphery and proximate the driving point by at least one guide means including at least two coaxial independent idlers arranged to turn freely on a stud support on opposite sides of a disc said indicator discs being supported by a central axle stud for rotation thereabout.

4,407,587
ELECTRONIC TIMER

Masanori Fujita, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 156,420, Jun. 4, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,430
Claims priority, application Japan, Jun. 11, 1979, 54-73299
Int. Cl.³ G04F 8/00; G04C 17/02
U.S. Cl. 368—108 **8 Claims**



1. An electronic timer, comprising:

a display comprised of a plurality of elongate segment electrodes arranged side by side in a generally circular array with the respective segment electrodes disposed extended radially of said array, a plurality of sector-shaped common electrodes arranged in two concentric rings and positioned opposite and concentric with said generally circular array of segment electrodes, said sector-shaped common electrodes dimensioned to oppose equal numbers of segment electrodes for defining groups of equal numbers of inner and outer display elements each comprised of a common electrode and a segment electrode, insulating means for insulating said segment electrodes from said common electrodes, and an electro-optical display medium disposed between said segment and common electrodes for responding to electrical signals applied to pairs of said electrodes defining display elements to change visual appearance so as to display information;

electrically conductive circuit paths connecting corresponding ones of said segment electrodes within each group of segment electrodes facing a different common electrode;

storage means for storing signals representing any desired preset time;

counting means for counting the lapse of time and for generating output signals representing the counted lapse of time;

display driving means responsive to selection signals for applying voltage pulses to said display elements for turning on and off respective ones of said display elements selected according to the selection signals;

first selection means responsive to the content of said storage means for applying to said display driving means selection signals effective to operate respective ones of said display elements for displaying the preset time represented by the contents of said storage means; and

second selection means responsive to the count developed by said counting means for applying to said display driving means selection signals effective to operate respective ones of said display elements for displaying a lapse of time relative to the preset time.

4,407,588
ELECTRONIC OSCILLATION COUNTING TIMER

Isao Arichi, Kurahshiki; Tetuya Wanibi, and Takuji Koh, both of Okayama, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 19, 1981, Ser. No. 294,421
Claims priority, application Japan, Aug. 20, 1980, 55-118445[U]
Int. Cl.³ G04F 8/00
U.S. Cl. 368—118 **2 Claims**

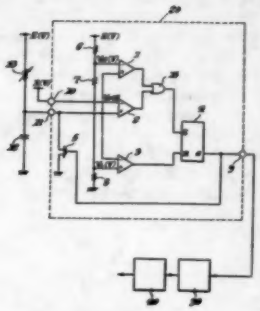
1. An electronic timer having an oscillator formed on a single IC chip, a time constant circuit connected to said oscillator and consisting of a resistor and capacitor connected in series, a counter which counts outputs of said oscillator up to a predetermined count value and thereupon generates an output, and an output circuit for generating an output signal in response to said output from the counter, said oscillator comprising

a first input terminal for connection with said time constant circuit,

a second input terminal adapted to be connected to a variable resistance for supplying a reference voltage,

a dividing resistance circuit for developing a first upper limit voltage and a lower limit voltage,

a first upper limit comparator connected to said resistance



circuit and to said first terminal for comparing a potential at said first terminal with said first upper limit voltage,

a second upper limit comparator connected to said second terminal for comparing said potential at first terminal with said reference voltage,

an OR-circuit for receiving outputs from said first and second upper limit comparators,

a lower limit comparator connected to said resistance circuit and to said first terminal for comparing the potential at said first terminal with said lower limit voltage,

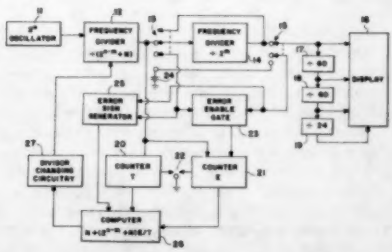
a flip-flop which is set by an output from said OR-circuit and reset by an output from said lower limit comparator, and

a transistor for discharging said capacitor in response to an output generated from said flip-flop.

4,407,589
ERROR CORRECTION METHOD AND APPARATUS FOR ELECTRONIC TIMEPIECES

John R. Davidson, 266 Nottingham Rd., and Joseph S. Heyman, 130 Indian Springs Rd., both of Williamsburg, Va. 23185

Filed Feb. 13, 1981, Ser. No. 234,225
Int. Cl.³ G04B 17/12
U.S. Cl. 368—201 **14 Claims**



7. In an electronic digital timepiece that includes an oscilla-

tor that has a 2^n frequency output, an n stage frequency divider for reducing the oscillator output frequency to a time keeping frequency, and means for counting and displaying the count of the time keeping frequency, apparatus for correcting errors in said timepiece due to changes in the output frequency of said oscillator comprising:

a first counting means connected to the output of the (n−m)th stage of said frequency divider where m is a whole number less than n and greater than zero;

a second counting means connected to the output of the (n−m)th stage of said frequency divider;

means for activating said first counting means for a selected period of time T whereby the first counting means counts the output of the (n−m)th stage of said frequency divider during the period T;

means for activating said second counting means for a period of time |E| where |E| is equal to the error accumulated by said time piece during said period T;

means for dividing the count on said second counting means by the count on said first counting means, multiplying by $(2^{n-m}+N)$ and adding N to produce a new adjustment value where N is the preceding adjustment value; and

means for adjusting the 2^{n-m} divisor of the first (n−m)th stages of said frequency divider by the amount of said new adjustment value.

4,407,590

BATTERY UNIT FOR AN ELECTRIC TIMEPIECE

Hideshi Ohno, Sayama; Kazunari Kume, Tokorozawa; Takatoshi Osaka, Higashikurume; Katsuo Nishimura, Tokorozawa; Munetaka Tamaru, Tokyo, and Sadao Ode, Hoya, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

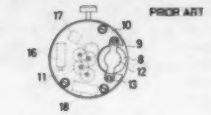
Continuation of Ser. No. 967,019, Dec. 6, 1978, abandoned. This application Aug. 13, 1980, Ser. No. 177,583

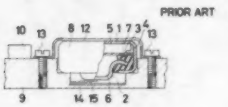
Claims priority, application Japan, Dec. 10, 1977, 52-148586; Dec. 15, 1977, 52-151055; Dec. 20, 1977, 52-153175

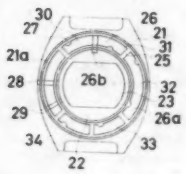
Int. Cl.³ G04B *1/00*; G04C *3/00*

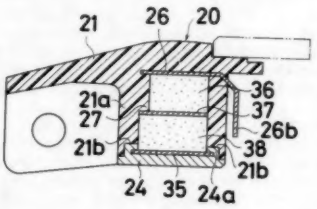
U.S. Cl. 368—204 **2 Claims**

1. An electric timepiece comprising a watch case and a battery unit forming an integral part of said electric timepiece, said watch case having a back and front portion made of a plastic material, said battery unit comprising at least one battery chamber formed in an edge portion of said watch case having a battery component, a removable cover made of a plastic material for covering said battery chamber at the back of said watch case, said battery component comprising a first electrode embedded in said edge portion of said watch case at a top portion of said battery chamber integral with said front portion of said watch case, a second electrode embedded in said cover, an anode blend and cathode blend provided in said battery chamber between said electrodes and a separator held on a shoulder formed in said edge portion of said watch case in said battery chamber so as to separate said anode and cathode









blends, said cover being separable from said anode and cathode blends.

4,407,591

BALLISTIC WIRE MATRIX PRINT HEAD

Contardo Adamoli, Castellamonte; Francesco Bernardis, Chiaverano; Franco Cretaz, Pont St. Martin, and Mario Gaiardo, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Italy

Filed Aug. 12, 1981, Ser. No. 292,173

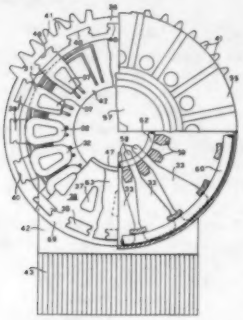
Claims priority, application Italy, Aug. 21, 1980, 68304 A/80

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **4 Claims**

1. A ballistic wire matrix print head comprising a guide assembly, a plurality of printing wires axially slideable in said guide assembly, a plurality of electromagnetic structures, each including a U-shaped core of ferromagnetic material provided with an outer pole piece and an inner pole piece, and an energizeable coil wound on said inner pole piece, means for supporting said electromagnetic structures and for dissipating the heat produced by the energization of said coils, said supporting and heat dissipating means comprising a cylindrical tube of a non-magnetic material having a plurality of internal axial seats radially disposed, into each of which is fitted one of said outer pole pieces, means for mounting said tube coaxially with respect to said guide assembly, said mounting means comprising a resin block which embeds said cores and said coils internally to said tube, and which is provided with a central through hole for housinga rear part of said guide assembly, a plurality of armatures disposed radially with respect to said guide assembly

and associated with said electromagnetic structures to form electromagnetic actuators for transferring electromechanical energy to said printing wires, and an armature retainer coupled



to said guide assembly for maintaining each armature in engagement with its associated pole pieces and with its corresponding printing wire.

4,407,592

POWER-OPERATED TYPEWRITER

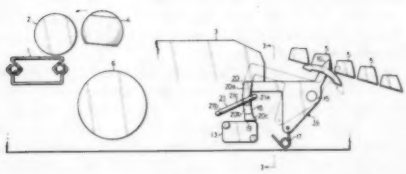
Hisao Kurachi, Okazaki; Takeo Ito, Kuwana, and Hiroshi Onoda, Kariya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Feb. 26, 1981, Ser. No. 238,228

Claims priority, application Japan, Feb. 28, 1980, 55-25568[U]

Int. Cl.³ B41J *23/08, 29/38, 29/56*

U.S. Cl. 400—54 **1 Claim**



1. In a power-operated typewriter comprising a powered motor, a electric power switch therefor, a drive shaft connected to said motor and rotated thereby, a driven mechanism including a printing mechanism, a movable carriage and a carriage return mechanism therefor, a plurality of print keys and a carriage return key each manually depressed for selectively operating an associated mechnism in said driven mechanism, and a first and a second clutch member provided on said shaft respectively, said first clutch member actuated in response to depressing of each said print key for translating a rotation of said shaft into powered action in said printing mechanism, said second clutch member actuated in response to depressing of said carriage return key for translating the same into powered action in said carriage return mechanism, the improvement which comprises;

a first control member and a second control member each pivotally mounted and caused to actuate said first clutch member and second clutch member respectively by depressing of said associated key,

an operating member having a manually operated portion, a switch controlling portion and a cam portion, and selectively and biasingly placed in first or second position for turning on or off said switch and holding thereof, and

a locking member movably mounted in connection with said first and second control members and urged to engage with said cam portion of said operating member, said locking member being in the form of a U-shaped rod so that its one end is elongated relative to said first control member, its other end is elongated relative to said second control member and its intermediated portion connecting them is urged to engage with the cam portion of said operating member and said first and second control members are simultaneously disabled by said one end and other end respectively when said operating member is shifted from said first position to said second position in order to turn off said switch, thereby neither said first nor second clutch members are actuated in spite of depressing of any of said keys during said motor stopping.

4,407,593

ARRANGEMENT FOR MONITORING THE OPERATION OF THE INK RIBBON OF AN INK-RIBBON MAGAZINE

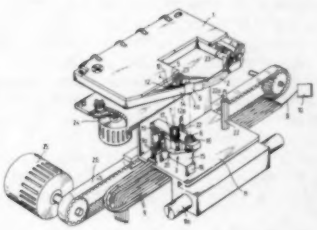
Johannes Haftmann, Paderborn, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,705

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 8108981[U]

Int. Cl.³ B41J *35/28*

U.S. Cl. 400—208 **6 Claims**



1. A devise for monitoring the physical condition of an ink ribbon (2) in an ink ribbon cassette (1) having an ink ribbon path and which is operatively but removably mounted on a printer unit (11), said device comprising:

first and second electrical contact means (12, 6) mounted on the cassette adjacent the ink ribbon path so as to contact opposite faces of the ribbon and be normally separated from one another by the ribbon, one (12) of said first and second contact means being resiliently biased toward the other (6) to provide a tensioning influence on the ribbon, each of said first and second contact means having an edge (5a, 6a) extending beyond the corresponding edge of said ribbon;

mounting means (15) on said printer unit adjacent said cassette when operatively mounted;

third and fourth contact means (7, 8) disposed on said mounting means in spaced relation for contacting the extending edges of the first and second contact means respectively when the cassette is operatively mounted;

means (19, 20) resiliently biasing said third and fourth contact means toward the extending edges of the first and second contact means; and

indicator means (10) carried by the printer unit and electrically connected to the first and second contact means through the third and fourth contact means and the bias means to generate a signal whenever the physical condition of the ribbon allows the first and second contact means to touch one another.

4,407,594

ERROR CORRECTING TYPEWRITER RIBBON SYSTEM

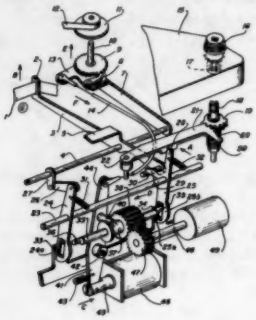
Manfred Link, Nuremberg, Fed. Rep. of Germany, assignor to Triumph-Adler A.G. fur Buround Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed May 28, 1981, Ser. No. 267,929

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023474

Int. Cl.³ B41J *35/10, 35/23*

U.S. Cl. 400—212 1 Claim



1. An error correcting typewriter comprising

carbon ribbon elevating mechanism,

carbon ribbon feed mechanism,

error correction ribbon elevating mechanism,

error correction ribbon feed mechanism,

first pivotally mounted lever means for simultaneously driving said carbon ribbon elevating and feed mechanisms,

second pivotally mounted lever means for driving said error correction ribbon elevating mechanism,

a motor cyclically responsive to a typing command,

an axially shiftable cam shaft coupled to said motor and normally coupled to drive said first pivotally mounted lever,

an electromagnet energizable in response to an error signal,

third pivotally mounted lever means coupled to said cam shaft operable in response to energization of said electromagnet for shifting said cam shaft to decouple said cam shaft from said first pivotally mounted lever and to couple it with said second pivotally mounted lever for driving said error correction elevating mechanism in response to a typing command, and

a drive connection between said third lever means to said error correction ribbon feed mechanism for driving said error correction feed mechanism.

4,407,595

COLOR PRINTING APPARATUS

Abraham H. Gershnow, Merrimack, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 31, 1981, Ser. No. 298,087

Int. Cl.³ B41J *35/14, 35/16*

U.S. Cl. 400—212 7 Claims

1. Apparatus for color printing for installation in a printer having a platen, a carriage, printing means mounted on the carriage, means for moving the carriage along parallel to the platen and means for actuating the printing means so that the printing means can print on a printing medium engaged on the platen, said apparatus including

A. means for supporting a cartridge containing an ink ribbon having at least four longitudinal bands of different colors disposed across the width of the ribbon between the printing means and the platen parallel to the platen so that, when actuated by the actuating means, the printing means prints indicia in a color corresponding to the one of the at least four ribbon segment color bands located opposite the printing means;

B. means for hinging the support means to the carriage at a location thereon distal to the platen so as to permit the support means to pivot on an axis lying parallel to the platen;

C. a rigid beam;

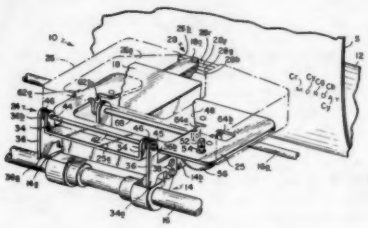
D. means for pivotally connecting said beam to the support means, said pivotal connection being located between the hinging means and the platen and displaced along the beam from the beam vertical centerline;

E. a first pivot connected adjacent to one end of the beam;

F. a second pivot connected adjacent to the other end of the beam;

G. means for maintaining the beam and support means in a reference position;

H. first means responsive to digital logic for lifting the first pivot from a lower position to at least one elevated position so that the beam is swung up about the second pivot thereby raising the support means a first selected distance above said reference position;



I. second means responsive to digital logic for lifting the second pivot from a lower position to at least one elevated position so that the beam is swung up about the first pivot thereby raising the support means a second distance above the reference position;

J. said beam and support means being lifted to a third selected position above the reference position when both said pivots are lifted to their at least one said elevated positions by said first and second lifting means, whereby the working edge of a ribbon cartridge positioned on the support means is moved vertically relative to the printing means so as to select one of the at least four different ribbon color bands for printing; and

K. stop means engaged by the lifting means for defining the elevated positions of said lifting means.

4,407,596

CASE SHIFT AND LOCK INPUT MECHANISM INCLUDING A SHIFT CONTROL SWITCH

Barry C. Reiner, Homer, N.Y., and Robert M. DuRoss, Huntsville, Ala., assignors to SCM Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,536

Int. Cl.³ B41J *25/24*

U.S. Cl. 400—253 6 Claims

1. A case shift and lock input mechanism assembled in a keyboard of a printer capable of printing lower case and upper case characters, the keyboard having a support frame, the improved mechanism comprising:

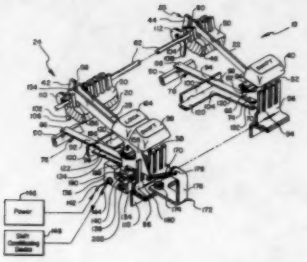
a pair of spaced apart shift keylevers mounted on the support frame for movement between a normal rest position and a depressed position independently of each other;

a lock keylever mounted on the support frame for movement between a supported position and a locked position independently of said pair of shift keylevers;

a single shift control switch in the mechanism fixed on the support frame and operable between a normal de-energized position for conditioning the printer to print lower

case characters and an actuated energized position for producing an electrical signal utilized for conditioning the printer to print upper case characters;

an abutment on said lock keylever for engageably actuating said shift control switch in response to said lock keylever being moved from said supported position to said locked position; and



a single member associated with said pair of shift keylevers and operable for mechanically actuating said shift control switch in response to either one of said pair of shift keylevers being moved from said rest position to said depressed position.

4,407,597

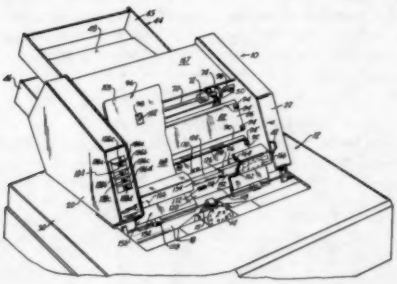
PAPER FEEDING APPARATUS FOR PRINTING APPARATUS

Ludwig J. Kapp, Montville, N.J., assignor to Ziyad Incorporated, Denville, N.J.

Continuation-in-part of Ser. No. 114,115, Jan. 21, 1980, Pat. No. 4,326,815. This application Jun. 9, 1981, Ser. No. 271,937

Int. Cl.³ B41J *11/58*

U.S. Cl. 400—625 **47 Claims**



1. A paper feeding apparatus for a printing device, which printing device includes printing means for printing on a sheet of paper, and paper drive means for providing relative movement between a sheet of paper and the printing means to effect printing on the sheet of paper, said paper feeding apparatus comprising:

first paper storage means for storing a first plurality of individual sheets of paper;

first paper feed means for feeding a sheet of paper from said first paper storage means in a paper feed direction along a paper feed path to said paper drive means;

second paper storage means for storing a second plurality of individual sheets of paper;

a deflector-support member for guiding sheets of paper fed from said first paper storage means and for supporting said second paper storage means, said deflector-support member having a first surface positioned along said paper feed path on the side opposite from said first paper storage means and extending parallel to said paper feed path to define a portion of said paper feed path, said first surface serving to deflect a sheet of paper fed by said first paper feed means from said first paper storage means to move said sheet of paper along said paper feed path toward said paper drive means, and said deflector-support member further including a second surface for supporting said second paper storage means;

means defining a paper passageway between said second surface of said deflector-support member and said paper feed path at a location along said paper feed path intermediate the location of said first paper storage means and said paper drive means; and

second paper feed means for feeding a sheet of paper from said second paper storage means through said paper passageway into said paper feed path toward said paper drive means.

4,407,598

TIMING HUB

Robert V. Hendershot, Evanston, Ill., assignor to Troika Corp., Evanston, Ill.

Filed Nov. 12, 1981, Ser. No. 320,449

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—4 **7 Claims**

1. A rotatably adjustable shaft coupling having a pair of coupling members for timing adjustment of input and output shafts joined thereto, comprising: a pair of hub members, each having means for connection with a shaft; connective means at the periphery of each hub member, an annular disk member cast about and thereby integrated with each said hub member and said connective means thereof and having a plurality of arcuately spaced openings therethrough; the number of openings in one disk member differing by at least two from the number of openings in the other disk member whereby to provide a differential in rotational positions of adjustment therebetween when two diametrically opposed openings in one disk member are coaxially aligned with corresponding openings in the other disk member; and connective means receptive in said aligned openings for positively coupling said disk members in face to face relationship whereby to rotatably adjust and join the input and output shafts connected to said hub members.

4,407,599

DEVICE FOR FIXING A DERAILLEUR ON A FRAME LUG

Roger Huret, deceased, late of Nanterre, France, and by Alain P. B. Huret, legal representative, Bougival, France, assignors to Huret et ses Fils, Nanterre, France

Filed Mar. 8, 1982, Ser. No. 356,039

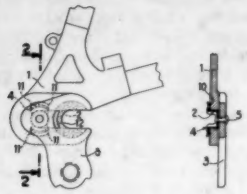
Claims priority, application France, Mar. 23, 1981, 81 05718

Int. Cl.³ B25G *3/00*; F16D *1/00*; F16G *11/00*

U.S. Cl. 403—11 **9 Claims**

1. A device for fixing a derailleur support on a frame lug of a bicycle, said device comprising an elastically yieldable fas-

tener which is permanently fixed on the support and provides cooperation with the frame lug ensures that the support is



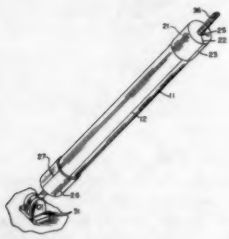
maintained in position relative to the frame lug, and means carried by the support centering the support relative to the frame lug.

4,407,600

TURNBUCKLE BOOT COVER

David M. Thompson, 803 Mentoloking Rd., Brick Town, N.J. 08723

Filed Sep. 24, 1981, Ser. No. 305,152
Int. Cl.³ F16B *11/00*
U.S. Cl. 403—23 4 Claims



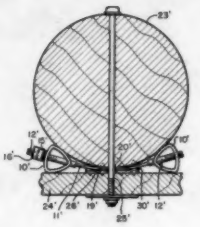
1. A turnbuckle boot cover comprising an elongated cylindrical central sleeve portion having a continuous axial slot, said central portion extending beyond a given turnbuckle in both directions; an upper cap having a top portion, a first cylindrical sleeve portion, and a second cylindrical sleeve portion, said upper cap top portion having a centrally-located hole the size of a given stay; said first upper cap sleeve portion having an inner diameter the size of the outer diameter of said central sleeve portion; said second upper cap sleeve portion having an outer diameter the size of the inner diameter of said central sleeve portion; said upper cap having an axial slot extending from said centrally-located hole through said top and sleeve portions; a lower cap having a bottom portion and a cylindrical sleeve portion; said lower cap bottom portion having a centrally-located hole to accomodate the lower connection of said turnbuckle to a given surface; said lower cap sleeve portion having an inside diameter the size of said outer diameter of said central sleeve portion; said lower cap having an axial slot extending from said centrally-located hole, through said bottom and sleeve portions; said elongated central sleeve, and said upper and lower caps, being of a resilient material whereby said slots can be spread apart to fit around the appropriate parts of said turnbuckle, stay, and lower connection; and said upper and lower cap portions can be fitted over the upper and lower ends of said central sleeve portion to seal said turnbuckle boot cover and reduce abrasion of adjacent sails or cordage.

4,407,601

CROSS-ARM BRACE

Gareld S. Reeder, Elk Grove Village, Ill., assignor to Commonwealth Edison Co., Chicago, Ill.

Filed Nov. 3, 1980, Ser. No. 203,702
Int. Cl.³ E04H *12/24*
U.S. Cl. 403—25 37 Claims



1. An improved utility pole cross-arm brace comprising:

first and second support members, each support member having outwardly-curved outer surfaces along its length, both support members positioned substantially parallel to each other;

at least one connecting member separably connecting the first and second support member, the at least one connecting member sized and shaped to lie across a face of a utility pole of the type comprising at least one cross-arm and a fastener which extends through the cross-arm and into the pole to securely mount the cross-arm to the pole, said utility pole and cross-arm being adapted to support utility cables; and

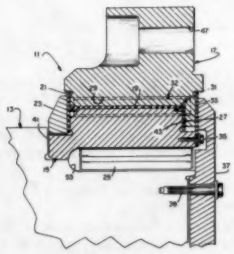
adjusting means, associated with the at least one connecting member, for varying the transverse spacing between the first and second support members, to wedge the first and second support members between the utility pole and the at least one cross-arm mounted to the pole such that the support members brace the at least one cross-arm against rotation in a plane transverse to the utility pole.

4,407,602

INSULATED COUPLING

Vincent G. Terry, Jr., Beverly, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Jan. 29, 1982, Ser. No. 344,210
Int. Cl.³ F16D *1/00*
U.S. Cl. 403—336 6 Claims



1. A coupling for joining two rotatable shafts, the coupling including two oppositely facing coupling members each mounted on a respective shaft; and, at least one coupling member comprising:

a radially inner hub mounted to its respective shaft;

a radially outer hub mounted concentrically around said

radially inner hub and adapted to be connected to its opposite coupling member;

electrical insulation at a circumferential interface between the inner and outer hubs whereby the hubs are electrically insulated from one another;

a first annular row of keys disposed at the interface between the shaft and the inner hub; and,

a second annular row of keys disposed at the interface between the inner and outer hubs, said second row of keys being electrically insulated.

4,407,603

FRICTION JOINT

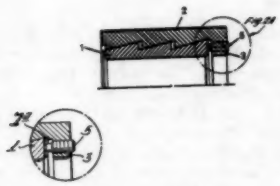
Bengt Lundgren, Lerum, Sweden, assignor to SKF Nova AB, Gothenburg, Sweden

Filed Oct. 27, 1980, Ser. No. 201,521

Claims priority, application Sweden, Nov. 19, 1979, 7909531

Int. Cl.³ B25G *3/20*; F16B *2/00, 7/04*

U.S. Cl. 403—370 **8 Claims**



1. A device for producing a friction joint comprising inner and outer members having concentric confronting opposed surfaces which in longitudinal section form a saw tooth contour with a number of portions inclined relative to the central axis of the surfaces and interengaging means actuating said members axially relative to one another effecting radial displacement through said inclined surfaces without rotation of said members and said means also preventing relative rotation of said members to improve torque transmitting characteristics of the device.

4,407,604

METHOD AND DEVICE FOR LAYING ROADMAKING MATERIAL IN A ROADWAY

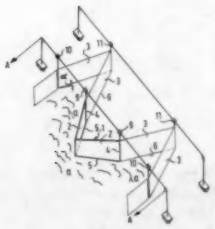
Massimo Spiritini, Passau, Fed. Rep. of Germany, and Christoph Stiehler, Dr.-Hellge-Strasse 19, 8390 Passau, Fed. Rep. of Germany, assignors to Christoph Stiehler, Hamburg, Fed. Rep. of Germany

Filed Jul. 22, 1981, Ser. No. 285,795

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028741; European Pat. Off., May 12, 1981, 81 103 648.2

Int. Cl.³ E01C *7/35*

U.S. Cl. 404—75 **14 Claims**



1. A method of resurfacing a roadway already surfaced with existing asphalt or like surfacing material and in which spaced tracks have been formed, the method comprising re-plasticizing the existing material of marginal regions of the tracks and of an intermediate strip therebetween, laying new surfacing material on the roadway so as to fill the tracks and cover the intermediate strip, grading the new material to a profile having a substantially flat section over the intermediate strip and domed sections over the tracks extending above the level of said flat section, then compressing the new material to provide a substantially flat surface across the entire extent of both the tracks and the intermediate strip.

4,407,605

METHOD AND APPARATUS FOR REPAIRING LONGITUDINAL SEAMS OR CRACKS IN ROAD SURFACES

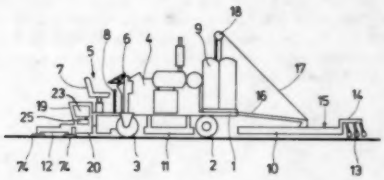
Reinhard Wirtgen, D 5461, Windhagen/Linz, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,071

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022513

Int. Cl.³ E01C *7/06, 19/05, 3/06*

U.S. Cl. 404—77 **16 Claims**



1. A method for patching longitudinal seams or longitudinal cracks which define substantially longitudinal gaps in road surfaces formed of bituminous material or similar road surface material, comprising the steps of: removing dirt and moisture from within the gap to clean the same by applying heat along the length of the gap; softening the road surface within the cleaned longitudinal gap and in the region of the gap by applying a second heating along the length thereof; loosening the softened road surface from the underlying road substrate; mixing the loosened and softened road surface with a new road surface material to form a road surface material compound; depositing the road surface material compound onto the road in the region from which the softened road surface was loosened; and compacting the deposited road surface material compound.

4,407,606

METHOD AND APPARATUS FOR PRODUCING AND LAYING A BALLASTED MAT FOR GROUND STABILIZATION

Ole J. F. Larsen, P.O. Box 3002, 6700 Esbjerg, Denmark

PCT No. PCT/DK80/00068, § 371 Date Jul. 8, 1981, § 102(e) Date Jul. 8, 1981, PCT Pub. No. WO81/01432, PCT Pub. Date May 28, 1981

PCT Filed Nov. 12, 1980, Ser. No. 285,078

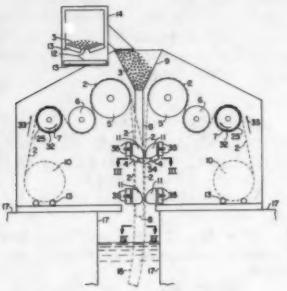
Claims priority, application United Kingdom, Nov. 13, 1979, 7939278

Int. Cl.³ E02B *3/12*

U.S. Cl. 405—17 **4 Claims**

1. A method of producing and laying on the ground a ballasted mat defined by two layers of sheet material joined together along parallel lines and enclosing particulate ballast material comprising the steps of providing two sources of sheet material, continuously drawing the sheet material from the two sheet material sources under the influence of the ballasted mat, continuously leading the sheet material to meet in generally overlapped relationship, seaming the sheet material to enclose at least two parallel compartments, continuously filling the

two parallel compartments with particulate ballast material, continuously advancing the sources of sheet material over the ground adapted to be covered by the ballasted mat, continuously lowering the ballasted mat to the ground during the



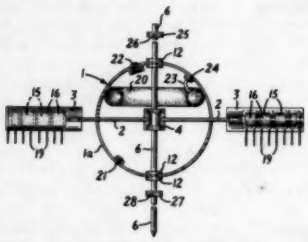
formation thereof and during the advancing of the sources of sheet material in timed relationship to the drawing of the sheet material from the two sheet material sources, and seaming crosswise the end of each ballasted mat and the adjacent end of the next ballasted mat.

4,407,607

FLUID DYNAMIC EROSION CONTROL UNIT

Joseph McCambridge, 12 Watson La., Setauket, N.Y. 11733

Filed Feb. 5, 1982, Ser. No. 346,264
Int. Cl.³ E02B *3/04*
U.S. Cl. 405—26 **19 Claims**



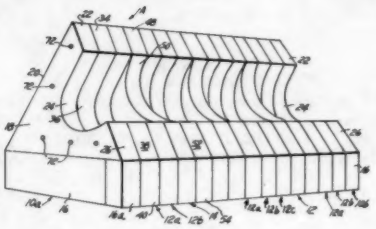
1. A fluid dynamic erosion control unit comprising a hollow submersible body having a shell, means for regulating the buoyancy of said body, means for rotatably positioning said body in submerged condition for rotation about an approximately vertical axis, a plurality of arms extending laterally of said body, a paddle-like blade on each of said arms, each of said blades having an effective area defined by the area of a vertical projection of the blade, means for reducing the effective area of said blades when moving against a flow of water past said unit, whereby flow of water past said unit produces rotation of said unit by exerting a greater force on blades of larger effective area when moving in the direction of water flow than on blades of reduced effective area when moving in a direction against the flow of water.

4,407,608

METHOD AND APPARATUS FOR CONTROLLING FLUID CURRENTS

Thom W. Hubbard, 3319 Pembrook Dr., Sarasota, Fla. 33579

Filed Jul. 27, 1981, Ser. No. 287,526
Int. Cl.³ E02B *3/06*
U.S. Cl. 405—31 **13 Claims**



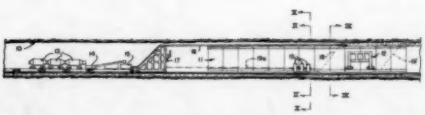
1. A method of controlling current flow of fluids having alluvium entrained therein, which comprises introducing into the path of an oncoming flowing fluid a shaped object having an interrupted front wall, said interrupted front wall being provided with a pair of spaced-apart, forwardly and downwardly directed sloping surfaces and a connecting concave surface, both of said sloping surfaces being substantially flat and extending across a common plane, said sloping and said concave surfaces being so disposed with respect to one another as to reverse the flow path of said fluid upon itself to deposit adjacent one of said sloping surfaces alluvium entrained therein, said object also having a relatively massive rear wall presenting an upwardly and forwardly directed planar surface, the top longitudinal edge of said rear wall forming a vortex along the top longitudinal edge of said front wall, and said rear wall receiving an oppositely flowing fluid and also being effective to cause deposition of alluvium entrained therein.

4,407,609

APPARATUS AND METHOD FOR PROVIDING NEGATIVE BUOYANCY FOR TUNNEL FORMS

Henry P. Cerutti, Seminole; Robert A. Cannon, and George G. Lindbloom, both of Allison Park, all of Pa., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 20, 1980, Ser. No. 208,625
Int. Cl.³ E21D *9/06*
U.S. Cl. 405—146 **14 Claims**



1. A form for a poured concrete tunnel lining comprising a series of adjacent arcuate forms arranged in side-by-side relation in a tunnel bore, a track attached to the interior of said forms, a wheeled vehicle movable on said track in load transmitting relation thereto carrying counterweight means in a load-bearing container for opposing the buoyant force of the liquid concrete at a desired region on said forms.

4,407,610

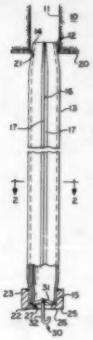
STABILIZER FOR AN EARTH STRUCTURE

Gerald W. Elders, 38 Yakashba Estates, Prescott, Ariz. 86301

Continuation-in-part of Ser. No. 134,939, Mar. 28, 1980, Pat. No. 4,350,462. This application Jan. 20, 1982, Ser. No. 341,067

Int. Cl.³ E21D *21/00, 20/00*

U.S. Cl. 405—259 7 Claims



1. A stabilizer for an earth structure having a bore with an opening, comprising:

(a) a support plate having a hole with cross-sectional dimensions smaller than the cross-sectional dimensions of the bore, the plate being positioned relative to the earth structure with the hole substantially aligned with the opening of the bore,

(b) an elongate support tube including:

1. means extending generally lengthwise responsive to peripheral compression of the tube to cause a contraction of cross-sectional dimension, and causing an expansion of cross-sectional dimension upon diminishment of peripheral compression, the plate hole compressing the tube upon insertion of the tube into the bore through the plate hole, and the tube expanding after passage through the plate hole to frictionally engage the surface of the bore in spaced relation to the bore opening for anchoring the tube within the bore, and

2. a driven end, and

(c) a sleeve having internal cross-section dimensions approximately or less than that of the plate hole, the driven end of the tube being located in and fixed to the sleeve, the sleeve providing an impact surface for accepting insertion forces for driving the tube through the plate hole and into the bore.

4,407,611

ANCHORED EARTH STRUCTURE

Richard Murray, Three Mile Cross, and Maurice J. Irwin, Camberley, both of England, assignors to The Secretary of State for Transport in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 1, 1981, Ser. No. 298,374

Claims priority, application United Kingdom, Sep. 4, 1980, 8028620

Int. Cl.³ E02D *29/02, 5/74*

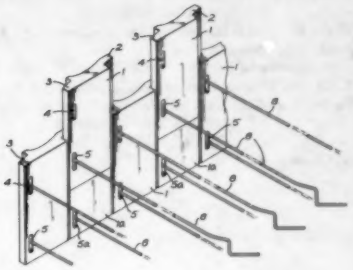
U.S. Cl. 405—284 10 Claims

1. An anchored earth structure comprising:

an earth fill;

a plurality of facing units bounding the earth fill, said facing units having overlapping flanges with vertically extending slots therein, the slots of an overlapping flange of one facing unit being arranged so as to be in substantial alignment with the slots of an overlapping flange of an adjoining facing unit;

a plurality of anchors embedded in said earth fill and attached to respective facing units of said plurality of facing units, each of said anchors having an anchoring portion at one end thereof and an attachment portion at an opposite end thereof, said anchoring portion having a substantially



serpentine form, said anchoring portion being further characterized by a spring-like resiliency, the attachment portion of said anchors extending through said slots; and

means for attaching said attachment portions of said anchors to respective facing units of said plurality of facing units.

4,407,612

SOIL AND/OR WATER-RETAINING WALL; METHOD FOR FORMING THIS SOIL AND/OR WATER-RETAINING WALL; AND FORMING MOULD SUITABLE FOR USE WITH THIS METHOD

Abraham F. van Weele, Waddinxveen, Netherlands, assignor to Foundacon BV, Netherlands

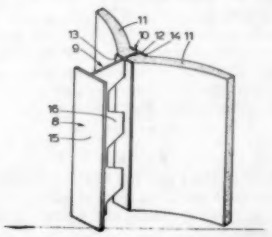
PCT No. PCT/NL80/00003, § 371 Date Sep. 30, 1980, § 102(e) Date Sep. 24, 1980, PCT Pub. No. WO80/01582, PCT Pub. Date Aug. 7, 1980

PCT Filed Jan. 30, 1980, Ser. No. 212,091

Claims priority, application Netherlands, Jan. 30, 1979, 7900704

Int. Cl.³ E02D *5/00*

U.S. Cl. 405—285 7 Claims



1. A soil and water retaining wall for protecting an excavation from the soil around it, and comprising:

a plurality of spaced prefabricated uprights which are introduced into the soil;

said uprights consisting of steel sections composed of:

a compression portion disposed towards the soil and having a first web, and two first flanges forming a space therebetween; and

a tensile portion disposed towards the excavation and having a second web welded to one of said first flanges, and a second flange; and

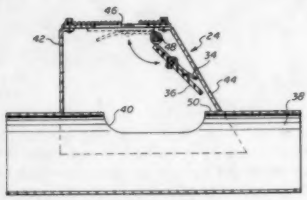
a plurality of intervening curved shells extending between said prefabricated uprights, said shells being formed of concrete or other hardenable material and being connected to said uprights without joints by ends which

completely fill the space between the first web and the first flanges of said compression portion.

4,407,613
SINGLE LINE PRESSURE-PRESSURE PNEUMATIC TUBE SYSTEM

William W. Jones, Houston, Tex., assignor to C. K. Kelley & Sons, Inc., Houston, Tex.

Continuation of Ser. No. 124,897, Feb. 26, 1980, Pat. No. 4,325,660. This application Jan. 22, 1982, Ser. No. 341,735
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.
Int. Cl.³ B65G *51/08*
U.S. Cl. 406—84 **14 Claims**



1. A single line pressure-pressure pneumatic tube system comprising: a first end terminal having a pressure unit therein; a second end terminal having a pressure unit therein; a line of tubing connecting the first terminal to the second terminal; two inline valves in the tubing line, one adjacent each terminal; each of said valves comprising a port for exhausting air from the tubing directly to the atmosphere and a freely pivotable closure means extending into the tubing and being pivoted away from the port by air flow in the tubing in one direction and being pivoted into engagement with the port to close the port by air flow in the tubing in the opposite direction; a carrier for travel in the tubing from one terminal to the other terminal upon pressurization of a terminal; said two valves being arranged in opposition so that the valve adjacent the pressurized terminal commences closure when the carrier is upstream thereof and fully closes after passage of the carrier, while the valve adjacent the other terminal commences opening when the carrier is upstream thereof for exhausting air from the tubing in front of the carrier directly to the atmosphere and fully opens after the passage of the carrier to exhaust air in the tubing behind the carrier directly to the atmosphere thereby reducing the pressure propelling the carrier and slowing the travel of the carrier to the other terminal.

4,407,614
APPARATUS FOR PERFORATING A WORKPIECE

Richard Muhr, and Karl Schink, both of Attendorn, Fed. Rep. of Germany, assignors to Muhr und Bender, Attendorn, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 971,418, Dec. 20, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,837
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759083
Int. Cl.³ B23B *39/08, 49/00*
U.S. Cl. 408—13 **5 Claims**

1. An apparatus for perforating an elongate workpiece, comprising:

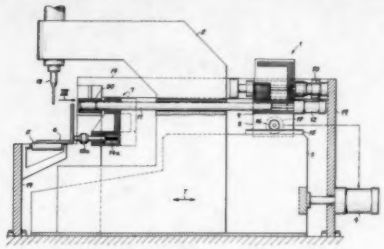
conveyor means for longitudinally transporting said workpiece along a predetermined path;

a main slide carrying tool means for perforating a workpiece confronted thereby;

an ancillary slide adjacent said main slide carrying sensing means for detecting a reference surface of said workpiece, said sensing means including a pair of closely juxtaposed elements relatively offset in a direction transverse to said path, each of said elements having an output emitting a detection signal in a predetermined approach position relative to said reference surface;

mutually independent first and second drive means for respectively displacing said main and ancillary slides in said transverse direction;

switch means connected to the outputs of said elements for operating said second drive means to advance said ancillary slide toward said path in the absence of a detection



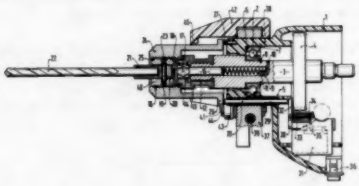
signal from both of said elements and to retract said ancillary slide in the presence of detection signals from both said elements; and

correlating means for determining a relative displacement of said slides and controlling said first drive means to restore said main slide to a predetermined position relative to said ancillary slide while holding the latter stationary by immobilizing said second drive means.

4,407,615
TOOL-CLAMPING DEVICE

Gerhard Kuhlmann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1980, Ser. No. 199,107
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943500
Int. Cl.³ B23B *31/08, 45/00*
U.S. Cl. 408—239 A **8 Claims**



1. A tool clamping device for a tool machine, particularly for use in hand tool machines having a housing, and a tool drive with a rotary drive spindle, comprising tool-receiving means adapted to clamp a tool to be used, said tool-receiving means being arranged so as to be moved relative to said drive spindle in an axial direction and to be selectively coupled with said drive spindle to permit relatively quick change of a tool to be used without utilization of a chuck; and locking means adapted to be selectively positioned between a locking position to limit the axial movement of said tool-receiving means and a released position to release said tool-receiving means to thereby permit relatively quick change of a tool to be used, said locking means including a locking plate and an axle mounted on said housing, said locking plate being arranged to pivot about said axle between said locking and released positions, said spindle being provided with a longitudinal recess, and said tool-receiving means including an outer sleeve having a radially outwardly extended flange and an inner sleeve threadably positioned within said outer sleeve and having a first end

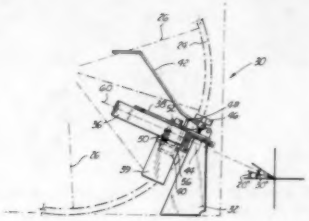
portion extending into said recess, a second end portion adapted to receive a tool to be used and a shaped intermediate portion.

4,407,616

WHEELCHAIR LOCK FOR REDUCING WHEEL SPOKE INTERFERENCE

William W. Hinze, Hutchinson, Kans., assignor to Collins Industries, Inc., Hutchinson, Kans.

Filed Aug. 24, 1981, Ser. No. 295,379
Int. Cl.³ B60P *7/08*; B60T *3/00*
U.S. Cl. 410—3 **10 Claims**



1. An improved wheelchair lock for securing a wheelchair, the wheelchair having a pair of ground wheels with spokes, the lock comprising:

a support;

a pair of guide arms attached to the support, the guide arms disposed in a spaced relationship to each other and extending outwardly from the support for receiving a portion of one of the ground wheels therebetween;

latch means attached to one of the guide arms, the latch means receiving a portion of one of the ground wheels when the ground wheel is received between the guide arms for securing the ground wheel therein, the latch means angled upwardly toward the center of the ground wheel; and

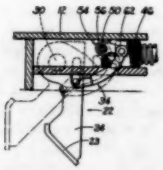
means for releasing the latch means so the ground wheel can be disengaged from between the guide arms.

4,407,617

COMBINATION MANUAL AND AUTOMATIC UNLOCKING MECHANISM FOR TRAILER HITCH HEAD

James C. Hammonds, St. Charles, and Ronald D. VanDyke, St. Peters, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 21, 1981, Ser. No. 295,154
Int. Cl.³ B60P *3/06*; B62D *53/08*
U.S. Cl. 410—59 **12 Claims**



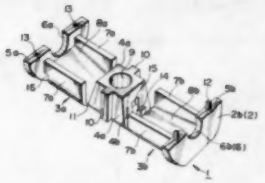
1. A tractor operated trailer hitch jaw opening mechanism comprising: a lock block link having a first end connected to a bumper block and a second end adapted to engage a lock block which holds the hitch jaws in closed position; pivot means connecting the bumper block to the hitch head; whereby when said bumper block is engaged by the tractor said bumper block rotates about said pivot means; and whereby this rotation moves said lock block link and said lock block rearwardly, which allows said jaws to rotate to open position to allow exit of the trailer kingpin; and lost motion means to allow said lock block link to move relative to the bumper block when said lock block is moved rearwardly manually.

4,407,618

FASTENER

Shigeru Kimura, Kamakura, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Mar. 6, 1981, Ser. No. 241,316
Claims priority, application Japan, Mar. 12, 1980, 55-31011[U]
Int. Cl.³ F16B *13/06*, *13/14*
U.S. Cl. 411—40 **4 Claims**



1. An integral molded plastic fastener comprising a plurality of legs each having an entering end and having an outwardly directed flange means at the opposite end, a polygonal screw receiving member disposed between said legs and having a central axial bore for receipt of a screw, and a plurality of integral hinges initially joining said leg entering ends to said screw receiving member enabling said legs to be moved from an initial splayed molded position to installation position with said legs in substantial parallelism embracing said screw receiving member, said legs having tapering surfaces confronting said screw receiving member which are in installation position spaced apart a predetermined maximum distance at said entering end and which taper toward one another approaching said flange means, said screw receiving member having tapering surfaces confronting sald leg confronting surfaces and spaced a maximum dimension adjacent said hinges and tapering towards one another away from said hinges said legs being adapted to be inserted through a hole in a panel to abut said flange means against a surface of said panel, a screw inserted past said flange means and threaded into said screw receiving member pulling said screw receiving member towards said flange means and causing the confronting tapering surfaces to cam said legs apart to fracture said hinge and to spread said legs apart on the opposite side of said panel from the surface engaged by said flange means.

4,407,619

BLIND FASTENER WITH DEFORMABLE CLAMPING MEANS

George Siebol, Renton, Wash., assignor to Olympic Fastening Systems, Downey, Calif.

Continuation-in-part of Ser. No. 77,344, Sep. 20, 1979, abandoned. This application May 19, 1980, Ser. No. 151,411
Int. Cl.³ F16B *00/00*
U.S. Cl. 411—43 **17 Claims**

1. In a blind fastener for joining side-by-side workpieces having aligned holes of a first predetermined diameter for receiving the fastener, and having:

a tubular sleeve having an outside diameter sized to fit through said holes and having a first head at one end for abutting against one side of the workpieces, and an opposite end portion for projecting beyond the other side of the workpieces to be expanded against the workpieces into a second head on said other side;

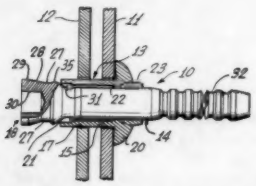
a setting pin extending through said sleeve for use in expanding said opposite end portion to clamp the workpieces together and form said second head, said setting pin having:

a central section smaller than the inside of said sleeve;

a pulling section on one end of said central section extending beyond said first head;

and an expanding head on the other end of said central section beyond said other end of said sleeve, to be drawn into said sleeve, said expanding head having a cylindrical expansion section joined to said central section and larger than said central section and the inside diameter of said sleeve, formed with a tapered leading end adjacent said opposite end portion, said expansion section having an outside diameter that is less than the size of said holes by an amount equal to twice the wall thickness of said sleeve, to expand the sleeve into, and hold it in, tight engagement with the workpieces;

and a tapered portion beyond said expansion section progressively increasing the size of said expanding head



from said expansion section toward said other end, to form said second head on said sleeve;

the improvement comprising:

a deformable annular clamping ridge encircling the leading end portion of said expansion section, and having a tapered leading face forming an included angle of approximately thirty degrees with the longitudinal axis of the setting pin, and having a crest with an outside diameter that is slightly larger than the diameter of said expansion section to define a relief area portion of said expansion section between said ridge and said tapered portion and having a diameter slightly less than the outside diameter of said crest, thereby to resist entry of said expansion section into said sleeve and composed of material that is sufficiently strong to expand the sleeve beyond the workpieces without substantial deformation of the ridge, said crest being formed from a material that is sufficiently soft for deforming when the workpieces are clamped together and being drawn off into the space between the relief area portion and said tubular sleeve to permit the expansion section to enter and fill tightly the portion of the sleeve that is inside the workpieces.

4,407,620

DRILL SCREW

Katsumi Shinjo, Osaka, Japan, assignor to Yugen Kaisha Shinjoseisakusho, Osaka, Japan

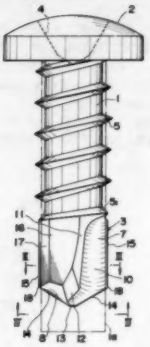
Filed Nov. 28, 1980, Ser. No. 210,979

Claims priority, application Japan, Dec. 29, 1979, 54-172577

Int. Cl.³ F16B *25/00*

U.S. Cl. 411—387 **6 Claims**

1. A drill screw comprising an elongated threaded stem having a driving head at one end and a drill bit at the opposite end thereof, said drill bit including at least two flutes equally spaced from each other around a central axis of the stem, each flute having a cutting edge at a forward edge thereof to be inclined rearwardly from an inward end of the cutting edge to an outward end thereof, a cutting blade at a side edge of the flute extending parallel to the central axis of the stem and a cutting surface located inside both said cutting edge and said cutting blade and having a concave bottom, said cutting edge and said cutting blade being located in an imaginary reference plane parallel to a plane extending radially outwardly from the



central axis of the stem and having acute rake angles extending toward the concave bottom of the cutting surface.

4,407,621

SELF-ADJUSTING TURNING ROLL ASSEMBLY

Erik Hansen, Gentofte, Denmark, assignor to ESAB Aktiebolag, Sweden

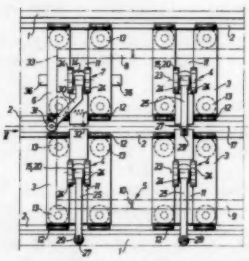
PCT No. PCT/SE80/00183, § 371 Date Mar. 11, 1981, § 102(e) Date Mar. 11, 1981, PCT Pub. No. WO81/00227, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 1, 1980, Ser. No. 247,536

Claims priority, application Denmark, Jul. 12, 1979, 2946/79

Int. Cl.³ B23Q *1/16*; B23K *37/02*

U.S. Cl. 414—433 **9 Claims**



1. Apparatus for supporting a workpiece including first and second axially disposed cylindrical bearing surfaces rotatable about a common longitudinal axis, said apparatus comprising a first pair and a second pair of rotatable support roller means for supporting said workpiece for rotation therewith, said first pair of said rotatable support roller means being disposed on either side of said longitudinal axis of said first bearing surface, and said second pair of said rotatable support roller means being disposed on either side of said longitudinal axis of said second bearing surface, one of said rotatable support roller means being pivotably mounted on a stationary member, carrage members for supporting each remaining one of said rotatable support roller means, said carriage members being mounted with respect to first and second paths parallel to said longitudinal axis and being independently and freely movable along one of said first and second paths in response to axial movements of said workpiece during rotation thereof in a predetermined direction, first adjustment means associated with each of said carriage members and responsive to axial movement of said

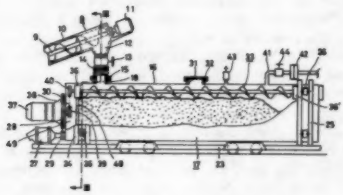
carriage members for causing said remaining ones of said rotatable support roller means supported by said carriage members to rotate about an axis substantially perpendicular to said longitudinal axis and thereby counteract said axial movement of said workpiece, and second adjustment means responsive to axial movement of said workpiece for causing said one rotatable support roller means to rotate about an axis substantially perpendicular to said longitudinal axis and thereby to counteract said axial movementof said workpiece.

4,407,622

SOIL TRANSPORTING VEHICLE FOR TRANSPORTING SOILS EXCAVATED BY SHIELD MACHINE

Toshihiko Ito, Kashiwara, Japan, assignor to Okumura Corporation, Osaka, Japan

Filed May 18, 1981, Ser. No. 264,614
Int. Cl.³ E21D 9/12; E02F 7/10; E21D 9/06; B60P 1/04
U.S. Cl. 414—468 1 Claim



1. A soil transporting vehicle for transporting the soil excavated by a shield machine having a pressure compartment defined therein between a cutter head and a diaphragm located behind the cutter head, into which pressure compartment the pressurized slurry or air is introduced, the vehicle comprising:

a cylindrical soil container having soil introduction and discharge opening means and being pressure resistant,

said soil introduction and discharge opening means consisting of a first opening and a second opening in said soil container, said first and second openings being aligned along a longitudinal axis of said soil container,

soil conveying means arranged in the soil container adjacent to said opening means for moving the soils in the soil container axially thereof,

a chassis for supporting the soil container rotatably about the longitudinal axis thereof,

drive means for rotating the soil container about said axis between a soil introduction position wherein said first and second openings are directed upwardly and a soil discharge position wherein said first and second openings are directed downwardly,

said soil container being provided with an inlet for introducing gas under pressure into the soil container, and a pressure regulating valve for regulating the pressure in said container to be substantially equal to that of said pressure compartment,

a compressor connected with said gas inlet for introducing said pressurized gas into said soil container through the gas inlet,

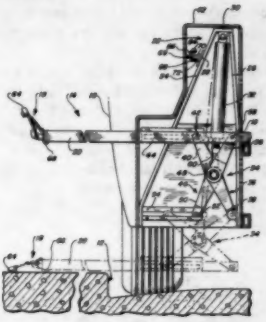
opening and closing valve means arranged between said compressor and said gas inlet for admitting said pressurized gas into said soil container to raise the pressure inside the soil container to be substantially equal to that of said pressure compartment before the soil is introduced into the soil container.

4,407,623

LIFT ASSEMBLY INCLUDING A REACTION SWITCH

William W. Parks, Glenview, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Oct. 24, 1980, Ser. No. 200,594
Int. Cl.³ B60T 1/44
U.S. Cl. 414—540 11 Claims



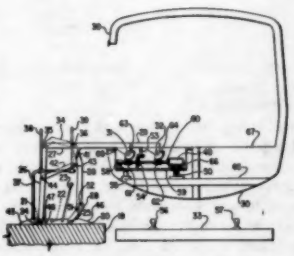
9. A device for sensing the engagement of a lift platform of a vehicle with an obstacle, wherein said lift platform includes a frame, and means for operating said lift platform, said device comprising a gap defined in said frame, first and second bridging members secured to said frame on opposite sides of said gap, means for resiliently biasing said first and second bridging members together across said gap, and switch means responsive to relative movement of said bridging members caused by said obstacle for deactuating said operating means.

4,407,624

WHEELCHAIR LOADING DEVICE FOR PASSENGER CARRYING VEHICLES

John C. Kingston, Suite 1210, 261 Cooper St., Ottawa, Ontario, Canada K2P 0G3

Filed Aug. 6, 1981, Ser. No. 290,597
Claims priority, application Canada, Feb. 23, 1981, 371502
Int. Cl.³ B60P 1/48
U.S. Cl. 414—546 10 Claims



1. A device for raising and lowering wheelchair using passengers to and from a passenger carrying vehicle, said device comprising:

a loading platform for transport of a wheelchair thereon;

a pair of spaced apart and opposed linkage means positioned on either side of said loading platform and which pivotally interconnect said loading platform to a framework of said vehicle for movement of said platform between ground level exterior of said vehicle and floor level interior of said vehicle, each of said linkage means including five pivotally interconnected links wherein a first common link disposed above said loading platform is pivotally con-

nected to said loading platform by a first set of spaced apart links and wherein the points of pivotal interconnection of said first set of links with said common link and said loading platform define the corners of a first parallelogram, and wherein said first common link is pivotally connected to said framework by a second set of spaced apart links and wherein the points of pivotal interconnection of said second set of links with said common link and said framework define the corners of a second parallelogram;

thrust link means interconnecting a link of said first set of links to a link of said second set of links for maintaining said loading platform out of contact with said vehicle when said loading platform is away from rest position interior of said vehicle; and

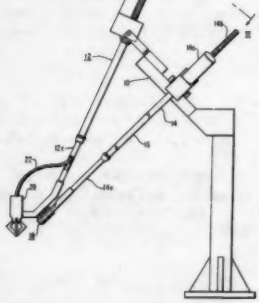
means co-operating with said linkage means for raising and lowering said loading platform.

4,407,625

MULTI-ARM ROBOT

Lanson Y. Shum, Westmoreland County, Salem Township, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1981, Ser. No. 264,154
Int. Cl.³ B25J *11/00*
U.S. Cl. 414—728 **9 Claims**



1. A robotic manipulator for automatically positioning a workhead comprising:

a support structure;

three arms having their remote end portions hingedly connected together at a single location which is at least relatively close to the point of intersection of the axes of the three arms, said location being adjacent the workhead connected to said three arms, and having their proximate end portions carried in gimbaled relation from said support structure at spaced apart locations thereat together defining the points of a triangle;

means for driving each arm axially and independently to move said workhead to different positions, said driving means being carried by said support structure and being fixed in location at said support structures, said workhead being in rigid relation to one of said three arms and spaced from said single location;

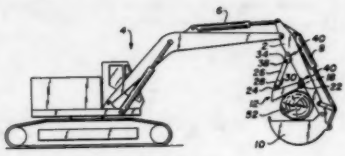
each arm being substantially straight from its remote end portion to its proximate end portion and rigid for its length in the sense that no part of the arm is hingedly connected to another part so that the forces derived from the payload weight and movement subject said arms primarily only to compression and/or tension.

4,407,626

GRIPPING DEVICE

Peter J. Bruckner, Box 187, Nakusp, British Columbia, Canada

Filed Jan. 30, 1981, Ser. No. 229,868
Int. Cl.³ E02F *3/28*
U.S. Cl. 414—740 **1 Claim**



1. A device to be mounted to a boom of a back hoe, the boom having a bucket and first and second spaced rods, the first rod closer to the bucket than the second rod the device comprising:

a first connection to pivotally engage the first rod;

a back plate attached to the first connection;

rows of teeth extending longitudinally of the back plate to extend towards the bucket of the back hoe;

a detachable second connection on the back plate, remote from the first connection;

a support arm detachably attached to the second connection at one of its ends and extending towards the boom;

the distance between the first and second connections being the same as the distance between the first and second rods;

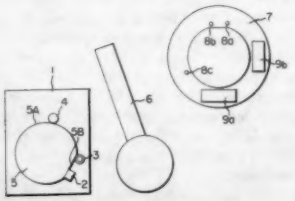
a detachable third connection to engage the second rod attached to the support arm at the other of its ends, whereby the device may be attached to the boom of a back hoe to provide a rigidly mounted gripping surface against which an object can be forced by movement of the bucket and thus held, and whereby the second and third connections may be detached to remove the support arm, and the back plate pivoted to a rest position, generally adjacent and parallel to the boom, and secured in that position by attaching the second connection on the back plate to the second rod.

4,407,627

AUTOMATIC WAFER ORIENTING APPARATUS

Hiroshi Sato; Kei Takatsu, and Junji Isohata, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 970,146, Dec. 18, 1978, abandoned. This application Apr. 21, 1981, Ser. No. 256,173
Claims priority, application Japan, Dec. 20, 1977, 52-154171
Int. Cl.³ B65G *47/24*
U.S. Cl. 414—757 **1 Claim**



1. An automatic wafer orienting apparatus for orienting a wafer with respect to a wafer chuck prior to alignment with a mask, comprising:

a first automatic wafer orienting sub-apparatus comprising:

a support plate for supporting a wafer having an orientation cut in a part of the peripheral edge thereof; and

wafer position defining members comprising a drive member contacting the peripheral edge of the wafer for rotating

said wafer on said support plate and defining members for contacting the peripheral edge of the wafer;

a transport device for transporting the wafer oriented in said first automatic wafer orienting sub-apparatus to a second automatic wafer orienting sub-apparatus; and

a second automatic wafer orienting sub-apparatus comprising:

a wafer chuck;

positioning members provided on said wafer chuck; and

means for pressing the thus transported wafer against said positioning members.

4,407,628

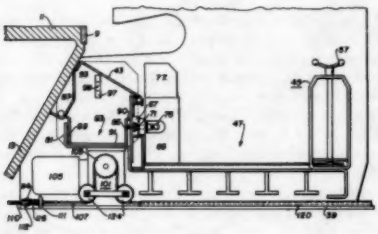
APPARATUS FOR HANDLING CUTTINGS FROM A SHEAR

Eugene W. Pearson, Orinda, Calif., and Wilbur G. Short, Browns, Ill., assignors to Canron Corporation, Oakland, Calif.

Division of Ser. No. 703,617, Jul. 8, 1976, Pat. No. 4,150,594. This application Oct. 30, 1978, Ser. No. 955,987

Int. Cl.³ B21D *43/22*

U.S. Cl. 414—35 **12 Claims**



1. A moveable car for use with a shear machine that produces both porduct and scrap, said car comprising:

a scrap collecting section;

a product collecting section;

a wall separating said car into forward and rearward sections;

said scrap collecting section located forward of said wall;

said product collecting section located rearward of said wall;

said wall having an upper portion inclined over said forwardly located scrap collecting section, and

means to move said car forward, towards said machine to a scrap collecting position, and rearward, away from said machine, to a product collecting position.

4,407,629

LIFTING APPARATUS FOR DOWN-HOLE TUBULARS

Clyde A. Willis, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Jul. 28, 1980, Ser. No. 172,543

Int. Cl.³ E21B *19/14*

U.S. Cl. 414—745 **20 Claims**

1. In a drill rig including a tower for supporting a string of down-hole tubulars and a boom pivotably mounted to the rig adjacent the tower to move between a parallel to the tower, said boom including a clamp for clamping and holding a down-hole tubular, the improvement comprising:

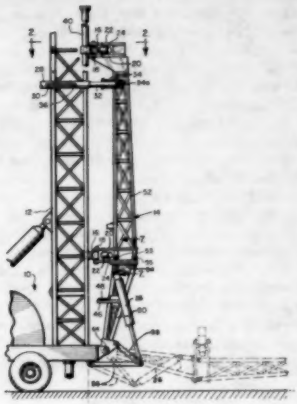
a support member mounted to the tower;

a bolt slidably mounted to the support member and movable between a first position, in which the bolt is retracted toward the support member, and a second position, in which the bolt is extended away from the support member on the side of the tower facing the boom;

means for locking the bolt in the second position;

a blocking member mounted to the boom and aligned with the bolt such that the bolt substantially abuts the blocking member when the boom is in the vertical position substantially parallel to the tower;

said support member, bolt, and blocking member positioned



to provide a safety frame between the boom and the tower at a level adapted to restrain the movement of vertically positioned down-hole tubulars between the tower, the boom, and the frame.

4,407,630

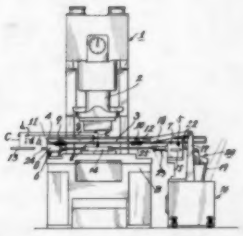
WORK FEED METHOD IN A PRESS

Setsuo Toda, No. 1-1392 Sobudai Danchi, Sagamihara-shi, Kanagawa, Japan

Division of Ser. No. 116,290, Jan. 28, 1980, Pat. No. 4,361,413. This application Nov. 13, 1981, Ser. No. 321,268

Int. Cl.³ B30B *13/00*

U.S. Cl. 414—786 **1 Claim**



1. A work feed method for a work feed apparatus for a press including a workpiece feed bar, a drive unit including a rocking means operatively connected to said feedbar and adapted to move said feed bar in the horizontal direction, an operation drum cam operatively connected to said rocking means to move it through a predetermined oscillating motion, a cam plate and a lift unit assembly having a mechanism connected to a lift rod adapted to be actuated by said cam plate to impart upward and downward movement to said feed bar, said feed bar being disposed in a press gap rearwardly of a die, and at least one workpiece vacuum clamper arm provided on said feed bar extending toward the front of said press and having supported thereon a workpiece vacuum clamping means, said rocking means and lift rod being adjustable, comprising when the press is at top dead center, two work suction vacuum clamper means provided on a feed bar are first moved in a linear line from their respective initial stop positions in which

one of said vacuum clamper means and the other vacuum clamper means are disposed in an intermediate position between a supply stage and a die and an intermediate position between said die and a discharge stage, respectively, in one direction until said one vacuum clamper means is positioned above said supply stage and said other vacuum clamper means is positioned above said die, respectively, second, said one and other vacuum clamper means are lowered to said supply stage and said die, respectively, to cause said one vacuum clamper means to clamp a supply workpiece thereto and said other vacuum clamper means to clamp a processed workpiece thereto, third, said one and other vacuum clamper means are raised, fourth, said one and other vacuum clamper means are linearly moved in the other opposite direction until said one and other vacuum clamper means are positioned above said die and above said discharge stage, respectively, fifth, said one and other vacuum clamper means are lowered to said die and discharge stage, respectively and unclamped to cause said one vacuum clamper means to supply said supply workpiece to the die and said other vacuum clamper means to discharge said process workpiece to said discharge stage, respectively, sixth, said one and other vacuum clamper means are raised and last, said one and other vacuum clamper means are linearly moved in said one direction to said initial stop positions, respectively whereupon said press is actuated for a cycle of pressing operation.

4,407,631

MOTOR-PUMP AGGREGATE

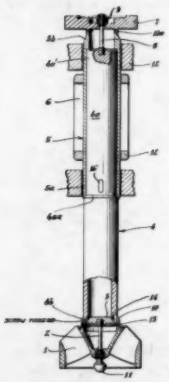
Wolfangang Schneider, Weisenheim; Josef Peters, Lambsheim, and Karl Gaffal, Hessheim, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,370

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1980, 3021318

Int. Cl.³ F01D *5/34*

U.S. Cl. 415—122 R **10 Claims**



1. In a motor-pump aggregate, particularly in an aggregate including a glandless centrifugal pump for use in nuclear reactor plants, the combination of coaxial pump and motor shafts having adjacent first end portions and second end portions remote from one another, one of said first end portions extending into the other of said first end portions; means for coupling said first end portions to one another so that said motor shaft can transmit torque to said pump shaft, including a conical seat in said other first end portion, a complementary conical external surface provided on said one first end portion and abutting against said seat, means for non-rotatably connecting said first end portions to one another, and means for sealingly urging said surface against said seat; impeller means adjacent to the second end portion of said pump shaft; and means for coaxially securing said impeller means to said pump shaft, including mating ring gears respectively provided on the second end portion of said pump shaft and on said impeller means.

4,407,632

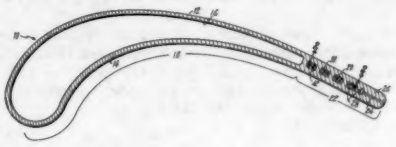
AIRFOIL PEDESTALED TRAILING EDGE REGION COOLING CONFIGURATION

George P. Liang, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 26, 1981, Ser. No. 277,480

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—97 R **8 Claims**



1. An airfoil having a suction side wall and a pressure side wall defining a forward portion of said airfoil and a trailing edge region of said airfoil, said trailing edge region including a trailing edge, said suction side wall and said pressure side wall being spaced apart defining a cooling air cavity within said forward portion and a slot of width W in said trailing edge region, said slot being in communication with said cavity for receiving cooling air from said cavity, said airfoil including means defining outlet passageways through said trailing edge in communication with said slot for discharging cooling air from said slot through said trailing edge;

a plurality of spaced apart pedestals extending across said slot from said pressure side wall to said suction side wall, said pedestals being arranged in an array wherein they are located at each vortex formed by two criss-crossing sets of parallel lines, the distance between adjacent parallel lines in both sets being equivalent to define a grid of congruent diamonds, said sets of parallel lines being angled relative to each other such that a line connecting a first pair of opposing vertices of each diamond is substantially parallel to the spanwise direction of the airfoil;

a plurality of suction side fences joining each pair of adjacent pedestals along each of the lines of one of said two sets of criss-crossing parallel lines, wherein each suction side fence is a wall of length G and of height A extending inwardly from said suction side wall, said height A being less than the slot width W; and

a plurality of pressure side fences joining each pair of adjacent pedestals along each of the lines of said other of said two sets of criss-crossing parallel lines, wherein each pressure side fence is a wall of height B extending inwardly from said pressure side wall, said height B being less than the slot width W.

4,407,633

HELICOPTER ROTOR

Rene L. Mouille, Aix-en-Provence, France, assignor to Societe Nationale Industrielle Aero., France

Division of Ser. No. 43,878, May 30, 1979, Pat. No. 4,304,525. This application Sep. 8, 1981, Ser. No. 300,091

Claims priority, application France, Jun. 2, 1978, 78 16521; May 8, 1979, 79 11585

Int. Cl.³ B64C *27/38*

U.S. Cl. 416—140 **12 Claims**

1. A rotary aircraft rotor comprising:

a rotor strut,

a hub arranged for rotation about a rotor axis and supporting a plurality of rotor blades each having a root and each having a longitudinal axis extending radially when the

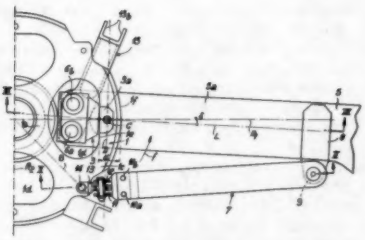
corresponding blade is in its neutral position which refers to it at rest or when the rotor rotates slowly,

said hub, including a central part in the form of a tubular stem prolonging said rotor strut,

and a top plate and a bottom plate each having radial arms of same dimensions regularly distributed around said rotor axis and arranged in a pair of superposed arms in vertical alignment for each blade,

and said hub being coupled to said root of each blade by means

(a) of a laminated spherical abutment having a center through which extends the blade flap axis and including a first rigid element presenting concave spherical surface and a second rigid element in the form of a convex spherical cap turned towards said hub central part and said concave spherical surface of said first rigid element, said laminated spherical abutment being received in a recessed yoke, the outer end of which is secured to said blade root and the inner end of which is radially disposed between said arms of said corresponding pair of arms of said top and bottom plates and secured to said first rigid element of said laminated spherical abutment, and



(b) of a brace, linked to said central part of said hub and to said yoke of said corresponding blade, wherein said brace is a resilient return brace comprising an elongated stock of metal plates alternating with elastomeric shock absorbing plates made of viscoelastic material having great persistence of deformation, the outer extremity of said resilient return brace being coupled to said yoke by a first ball joint the center of which is near the flap axis of said corresponding blade, and the inner extremity of resilient return brace being coupled to a place of said hub central part by a second ball joint the center of which is on the longitudinal axis of an immediately neighbour blade when said longitudinal axis is extending radially, and wherein said second rigid element of said laminated spherical abutment is integral with a holder fitted between and directly secured to said arms of said corresponding pair of arms of said top and bottom plates by means of at least two bolts extending through pairs of superposed holes in the outer end portion of said arms and apertures in said holder, said apertures having axes defining a plane in which said flap axis of said corresponding blade is preferably received.

4,407,634

AXIAL-FLOW STEAM TURBINE WHEEL

John Tones, Heddon on the Wall, England, assignor to Northern Engineering Industries plc, Newcastle upon Tyne, England

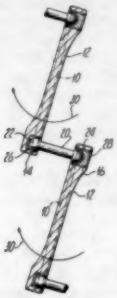
Filed Aug. 13, 1982, Ser. No. 407,875

Claims priority, application United Kingdom, Sep. 8, 1981, 8127167

Int. Cl.³ F01D *5/22*

U.S. Cl. 416—196 R **5 Claims**

1. A steam turbine wheel comprising blades each of twisted form and each including a tip section and elongate members which are interposed between said tip sections of said blades and which are effective to inhibit flutter of said tip sections, said wheel further comprising for each said elongate member two ball-and-socket arrangements one at each end of each said elongate member, each said elongate member extending between the tip sections of two of said blades said two blades being mutually adjacent blades, each said elongate member



being pre-stressed in compression so as to exert thrusts on said two blades to pre-stress said two blades torsionally each in a sense corresponding to untwisting of said twisted form of said blade, each said thrust being exerted on the respective one of said two blades through a respective one of said ball-and-socket arrangements.

4,407,635

AIRCRAFT PROPELLER ASSEMBLY WITH COMPOSITE BLADES

Richard V. Grimes; W. Benjamin Harlamert, both of Piqua, Ohio, and David F. Thompson, Chester, Pa., assignors to TRW Inc., Cleveland, Ohio

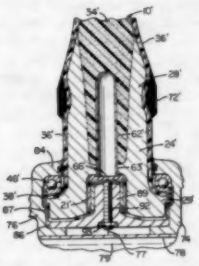
Continuation of Ser. No. 1,961, Jan. 8, 1979, Pat. No. 4,302,155.

This application Nov. 16, 1981, Ser. No. 321,771

The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.

Int. Cl.³ B64C *11/26*

U.S. Cl. 416—230 **9 Claims**



1. An aircraft propeller assembly comprising a rotatable propeller hub supporting a plurality of radially extending composite propeller blades, each of said composite blades including an elongated core of substantially rigid plastics material, a skin of plastic resin impregnated material surrounding said core, a rigid base member supporting said core and having an outwardly projecting inner flange portion integrally connected to an undercut neck portion of reduced outside diameter, means defining a bore within said base member, means connected to said propeller hub and supporting a bearing within said bore to provide for rotating said blade relative to

said hub, said skin material on said blade continuing radially inwardly along said neck portion of said base member in overlying relation and having a skin flange portion projecting laterally outwardly adjacent said flange portion of said base member, securing means extending around said skin material surrounding said reduced neck portion and spaced radially outwardly from said skin flange portion for forming a first rigid connection of said skin material to said base member, means connected to said propeller hub and including an inwardly projecting retention lip portion substantially surrounding said base member, and said lip portion being disposed radially between said skin flange portion and said securing means and radially overlying both of said flange portions to form a second rigid connection of said skin material to said base member.

4,407,636

SELF-CLEANING SUBMERSIBLE PUMP

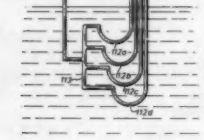
Nigel D. King, Southampton, England, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 99,664, Dec. 3, 1979, abandoned, which is a continuation of Ser. No. 868,055, Jan. 9, 1978, abandoned. This application Nov. 30, 1981, Ser. No. 325,972

Claims priority, application United Kingdom, Jan. 10, 1977, 719/77

Int. Cl.³ F04F *1/10, 7/00*

U.S. Cl. 417—118 **1 Claim**



1. A self-cleaning pump for simultaneously and intermittently pumping a plurality of relatively small liquid samples from different levels of a body of liquid, such as sewage containing solid particles, comprising, in combination, supply means for providing a propellant gas, an unobstructed plurality of downcomer conduit portions connected through a single conduit to said supply means, each downcomer conduit portion operably associated with a respective unobstructed riser conduit portion, and each riser conduit portion in communication at one end with one end of each downcomer conduit portion substantially at the lowest region thereof for the passage of a propellant gas from the other end of the respective downcomer conduit portion to the other end of the respective riser conduit portion, each of said downcomer conduit portions and said riser conduit portions arranged to be fixedly submerged at least partially in said liquid, respective ones of said riser conduit and downcomer portions being disposed at different levels within said liquid in which said plurality are submerged, an unobstructed inlet orifice located in the lowest region of each one of the respective conduit portions for the entry of liquid thereinto from said body of liquid when each orifice is submerged in the liquid, each said orifice being sized to permit the inlet of liquid into each said riser conduit portion and each said downcomer conduit portion to a level equal to the level of liquid in said body of liquid and to block entry of solid particles of greater size than said orifice between successive pulses of a propellant gas, said supply means being intermittently activated to pass a propellant gas through said single conduit into each other end of the respective downcomer conduit portions to clear solid particles in said liquid away from said orifices and simultaneously propel liquid from each said downcomer conduit portion to said other end of each respective raiser conduit portion, whereby some liquid and propellant gas are propelled out of said conduit portions through each said orifice during operation of said pump for at least temporarily freeing each said orifice of any orifice-obstructing solid particles.

4,407,637

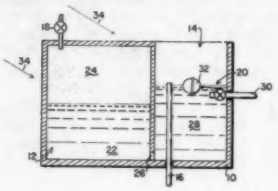
SOLAR POWERED LIQUID METERING DEVICE

John C. Newby, 41289 Malcolmson St., Fremont, Calif. 94538

Filed Jan. 22, 1981, Ser. No. 227,183

Int. Cl.³ F04F *1/02*

U.S. Cl. 417—138 **7 Claims**



1. A solar powered liquid metering device comprising:

a unitary container including:

a solar chamber sealed from atmospheric pressure, said solar chamber containing a quantity of a liquid to be pumped in a lower portion thereof and an expansible gas filling the remaining volume thereof, said solar chamber having at least one wall adapted to be exposed to direct solar radiation, and

an overflow chamber open to atmospheric pressure and also containing a quantity of said liquid, said solar chamber and said overflow chamber being separated by a wall having an opening at a lower end thereof to allow fluid communication between said liquid within said solar chamber and said liquid within said overflow chamber; and

an overflow outlet opening within said overflow chamber for draining excess liquid from said overflow chamber that is above a predetermined level,

filler means coupling a supply of said liquid to said overflow chamber and operative to permit liquid to flow from said supply into said overflow chamber when said liquid level within said overflow chamber is below said predetermined level, and

valve means permitting a preselection of the amount of liquid metered out during an operating cycle by allowing the amount of gas within said solar chamber to be varied prior to the commencement of said operating cycle by opening said valve means and introducing or removing gas from said solar chamber, said valve means being normally closed during said operating cycle.

4,407,638

SWASH PLATE TYPE COMPRESSOR WITH SILENCER STRUCTURE

Kazushi Sasaya, Katsuta; Takashi Degawa; Atsushi Suginuma, both of Mito, and Noriharu Sato, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1981, Ser. No. 229,063

Claims priority, application Japan, Jan. 28, 1980, 55-7846

Int. Cl.³ F04B *3/02*

U.S. Cl. 417—269 **14 Claims**

1. A swash plate type compressor provided with a silencer structure, comprising:

a rotary shaft;

a swash plate secured to said rotary shaft;

at least one cylinder block journalling said rotary shaft for rotation;

a plurality of pistons engaged by said swash plate and caused to move in reciprocatory movement in a direction parallel

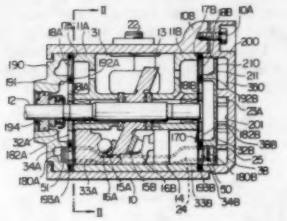
to said rotary shaft by the rotary swinging movement of said swash plate;

a plurality of cylinder bores formed in said cylinder block, each of said cylinder bores having fitted therein one of said pistons for sliding movement;

an end plate attached to an end of said cylinder block opposite said swash plate;

first partition wall means defining at one side of said plate a first flat space separated from atmosphere;

second partition wall means defining at one side of said first flat space a second flat space separated from atmosphere;



a high pressure chamber in said first flat space receiving a compressed refrigerant discharged from said cylinder bores and introduced thereinto through said plate;

passage means for directing the compressed refrigerant discharged from said high pressure chamber in a generally radial direction toward the center of said second flat space; and

refrigerant draw-off passage means opening at one end in the center of said second flat space and communicating at the other end externally of said compressor.

4,407,639

COMPRESSOR

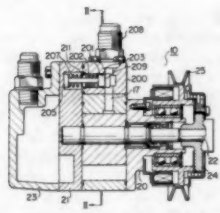
Teruo Maruyama, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 22, 1982, Ser. No. 341,607

Claims priority, application Japan, Jan. 29, 1981, 56-12425

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—292 **4 Claims**



1. A compressor having a rotor, a cylinder rotatably accommodating said rotor, vanes slidably carried by said rotor, side plates secured to both sides of said cylinder so as to close both open ends of cylinder chambers defined by said rotor, vanes and said cylinder, a suction port and a discharge port for a refrigerant, and a temperature-sensitive valve disposed in a passage leading to said suction port and adapted to control the state of opening of said suction port, characterized in that said compressor satisifies the following condition of:

$$0.025 < \theta_s a_1 / Vo < 0.080$$

where, a_1 is given by the following formula of:

$$\bar{a}_1 = \int_o^{\theta_s} \theta^2 a_1(\theta) d\theta \Big/ \int_o^{\theta_s} \theta^2 d\theta$$

wherein, $a_1(\theta)$ represents the effective area (cm^2) of suction passage between an evaporator and said vane chamber in the state where said temperature-sensitive valve has been controlled, θ_s represents the angle (rad) of rotation of said rotor from the position at which the suction stroke is started and the position at which the suction stroke is completed, and Vo represents the volume of said vane chamber at said position at which the suction stroke is completed;

said compressor further satisfying the following relationship where, a_2 is given by the following formula of:

$$\bar{a}_2 = \int_o^{\theta_s} \theta^2 a_2(\theta) d\theta \Big/ \int_o^{\theta_s} \theta^2 d\theta$$

where, $a_2(\theta)$ represents said effective area of suction passage in the state where said temperature-sensitive valve is in the opening position.

4,407,640

RECIPROCATING PUMP HAVING UNIQUE PRESSURE CONTROL VALVE CONSTRUCTION

Yoriaki Namekata, Osaka, Japan, assignor to Arimitsu Industry Co., Ltd., Osaka, Japan

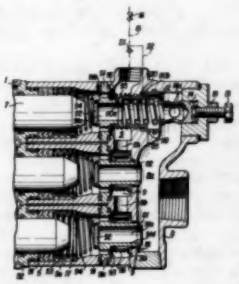
PCT No. PCT/JP80/00009, § 371 Date May 18, 1981, § 102(e) Date May 7, 1981, PCT Pub. No. WO81/00889, PCT Pub. Date Apr. 2, 1981

PCT Filed Jan. 25, 1980, Ser. No. 261,205

Claims priority, application Japan, Sep. 18, 1979, 54-120480

Int. Cl.³ F24B *49/08*

U.S. Cl. 417—296 **2 Claims**



1. A reciprocating pump, comprising:

a cylinder;

a freely reciprocable plunger supported within said cylinder; and

a suction passage, a discharge passage and a valve device located at a front end of said cylinder, said valve device comprising:

a valve seat having a suction bore in its central portion and a discharge bore in its outer peripheral portion;

a pressure control valve, supported by the valve seat, having at least one pressure receiving surface disposed within said discharge passage, said pressure control valve being biased to the valve seat through a control spring;

at least one suction valve connected to said suction passage and at least one discharge valve connected to said discharge passage, said discharge valve being located at the outlet side of said discharge bore, said suction valve and said pressure control valve being located at the inlet side

of the suction bore, said pressure control valve being constructed with a through bore through which the suction bore communicates with the suction passage; and

a pressure adjusting member supporting said control spring located movably at a cylinder head at the front end of said cylinder,

said plunger reciprocating to actuate the suction valve and the discharge valve at the valve device.

4,407,641

ELECTRICALLY-DRIVEN ROTARY VANE PUMP

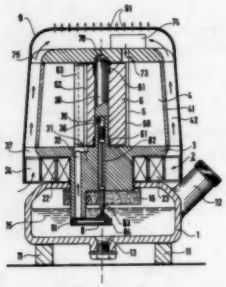
Jacques Long, Annecy, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 21, 1981, Ser. No. 285,688

Claims priority, application France, Jul. 23, 1980, 80 16225

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—356 **2 Claims**



1. An electrically-driven rotary vane vacuum pump comprising:

a hollow pump housing defining an oil sump,

a fixed hub mounted to said housing and overlying said sump,

a pump shaft fixed to said hub and extending vertically upwardly therefrom,

an annular electric motor stator mounted on said hub surrounding said shaft,

a pump stator comprising a tubular non-magnetic inner lining within said electric motor stator,

a rotor common to said pump and said electric motor,

bearings borne by said fixed shaft for mounting said rotor for rotation about the shaft axis and ecentrically within said tubular lining,

said rotor constituting a squirrel-cage rotor and carrying radially movable vanes for contact with the lining to provide a pumping action when the rotor rotates,

said rotor including at least two radially directed peripheral slots between bars of said squirrel-cage rotor,

said rotor being generally cylindrical and being mounted inside the tubular pump stator in a fashion such that it is substantially tangential thereto along a tangential line of contact and forming a vacuum pump chamber therebetween,

means defining a suction opening and an escape opening to said chamber defined by said rotor and said eccentrically positioned tubular lining and being located at plus or minus 80° from said tangential line of contact between said rotor and said tubular lining,

an oil supply opening within said hub leading to said eccentric pumping chamber,

an oil circulation valve positioned within the sump at a level normally immersed within the oil borne by said sump and communicating with said oil supply opening,

and wherein said electrically-driven rotary vane vacuum pump further comprising electromagnetic means provided within one end of said fixed shaft and operatively engaging said oil circulation valve and being responsive to magnetic fields produced by operation of the electric motor for opening said oil circulation valve when the motor is in operation and for closing said oil circulation valve when the motor is not in operation, in order to avoid the entry of oil into the eccentric vacuum pump chamber when the electric current is off.

4,407,642

FUEL SUPPLY UNIT

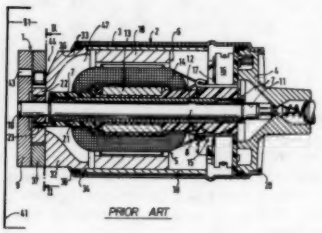
Ulrich Kemmner, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

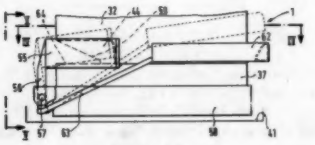
Filed Jan. 26, 1981, Ser. No. 228,043

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003828

Int. Cl.³ F04B *17/00;* B67D *3/00*

U.S. Cl. 417—366 **2 Claims**





1. A fuel supply unit, comprising a pumping element and an electromotor arranged to drive the same, said pumping element and electromotor being housed together in a common housing having a cylindrical body portion at one end thereof, said housing being secured in an upright position in the interior of a fuel container in such a manner that the pumping element cylindrical body portion is located near the bottom of said fuel container, said pumping element having a first intake area oriented toward the bottom of the fuel container and a second intake area remote from the bottom of said fuel container, and a closure member externally movably disposed on said fuel supply unit for movement transversely of the cylindrical body portion to close said second intake area from the outer side of said pumping element, said closure member being actuatable by means of a floater body, the position of said floater body being determined by the level of the fuel within said fuel container, said closure member and said floater body being interconnected via a lever means externally pivotably supported on a holder sleeve placed over said cylindrical body portion, said closure member having a semi-circular cross section arranged to partially surround said cylindrical body portion on said housing in proximity to said intake areas, said floater body being embodied as a hollow, semi-annular body which partially surrounds said fuel supply unit on a side remote from said second intake area.

4,407,643

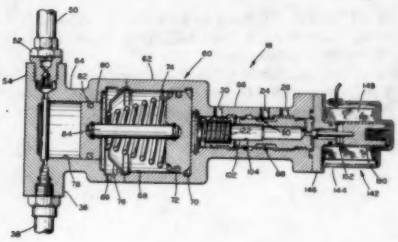
POWER FLUID SYSTEM EMBODYING TWO-FLUID PUMP

Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 95,735, Nov. 19, 1979, abandoned. This application Oct. 1, 1981, Ser. No. 307,359

Int. Cl.³ F04B 17/04

U.S. Cl. 417—401 1 Claim



1. A pump comprising, in combination, a housing extending substantially linearly and defining a small diameter portion at one end thereof, a large diameter portion and valve portion, the small diameter portion including an inlet and an outlet for communicating a first fluid through said housing small diameter portion, a small diameter piston movably disposed within said housing small diameter portion and exposed to said first fluid, a large diameter piston movably disposed within said housing large diameter portion, a connecting rod secured to said large diameter piston and secured to said small diameter piston to move therewith, a valve member movably disposed within said housing valve portion, said housing valve portion including passage means to communicate a second fluid under pressure through said housing in communication with said valve member, and a solenoid assembly coupled to the other end of said housing, said housing defining a linearly extending stepped bore to movably receive said pistons and valve member, said solenoid assembly cooperating with said valve member in an energized state to move said valve member within said housing in order to communicate said second fluid under pressure with said large diameter piston via said stepped bore, said large diameter piston being movable from a rest position in response to the fluid pressure of the second fluid to move said small diameter piston from its rest position, said small diameter piston moving within said housing to develop fluid pressure for the first fluid, said pistons being biased to their rest positions by resilient means within said housing, said valve member defining a central passage communicating with said passage means when said valve member is moved by said solenoid assembly, said central passage cooperating with said linearly extending stepped bore to communicate second fluid pressure to said large diameter housing portion, said solenoid assembly including a rod engageable with said valve member to move the latter in the energized state and also cooperating with said valve member to close an end of said central passage, said solenoid assembly further including a base plate carried by the valve portion of said housing, said base plate substantially closing one end of said stepped bore and engaging said valve member to define the rest position for the latter, said base plate also forming an opening for receiving the rod, said valve member defining a bypass passage communicating said central passage with said passage means to always maintain flow of second fluid pressure through said housing, and resilient means cooperating with said valve member and said rod to bias the same to their rest positions.

4,407,644

FUEL INJECTION PUMPING APPARATUS

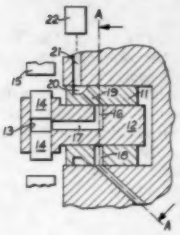
Colin P. Brotherston, Rainham, and Anthony J. Adey, Gravesend, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Dec. 17, 1980, Ser. No. 217,465

Claims priority, application United Kingdom, Jan. 19, 1980, 8001836

Int. Cl.³ F04B 19/02

U.S. Cl. 417—462 3 Claims



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a body part, a rotary distributor member mounted in the body part, a bore formed in the distributor member and a plunger therein, a cam for imparting inward movement to the plunger as the distributor member rotates, and means for conveying fuel to and from said bore, said means comprising a single passage communicating with said bore and including an axially extending portion and an inclined portion extending at an angle to the axis of rotation of the distributor member and breaking out onto the periphery of the distributor member, a plurality of outlet ports in the body part and with which said passage can register in turn as the distributor member rotates during successive pumping movements of the pumping plunger, a plurality of inlet ports alternatively arranged with said outlet ports, said inlet ports being in communication with a source of fuel, and a pair of interconnected drillings in the distributor member, said drillings extending to the periphery of the distributor member and being positioned to register with an inlet port and an outlet port after said outlet port has been supplied with fuel.

4,407,645

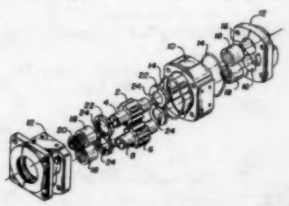
GEAR PUMP HAVING AN ISOLATOR TO PROTECT ITS BEARINGS

Harry Haigh, Cranbrook, and Rudy C. Sonmor, Vancouver, both of Canada, assignors to R.C.S. Enterprises Limited, Vancouver, Canada

Filed Jul. 10, 1981, Ser. No. 282,207

Int. Cl.³ F04C 15/00

U.S. Cl. 418—131 3 Claims



1. A gear pump useful with a hydraulic fluid having a water base, the gear pump comprising:

a housing;

a drive gear on a driveable hub and an idler gear engaging with the drive gear and carried by an idler hub, the drive hub and the idler hub each being mounted in bearings at both ends of the housing;

an isolator between each bearing and the hydraulic fluid, said isolator comprising a recess to receive an end of each bearing;

a sealing member positioned within each recess to seal against the outer surface of the shaft at the sealing members inner edge and to seal against the outer edge of the recess at the sealing member's outer edge.

4,407,646

APPARATUS FOR MAKING VIDEO DISCS

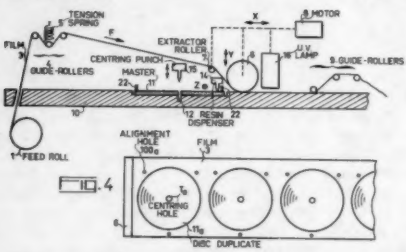
Claude Bricot, and Gerard Robin, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Division of Ser. No. 127,116, Mar. 4, 1980, Pat. No. 4,354,988. This application Mar. 3, 1982, Ser. No. 354,457

Claims priority, application France, Mar. 6, 1979, 79 05733

Int. Cl.³ B28B *17/00*

U.S. Cl. 425—174.4 **9 Claims**



1. An apparatus for producing video discs from at least one master having an engraved zone carrying information in the form of surface micro-reliefs, comprising:

a horizontal base within which said master is embedded;

means operatively associated with said base for feeding a flexible film forming a transparent substrate in a layer across said base and said master;

a pressure roller operatively associated with said base and which further comprises means for transversely moving said pressure roller in a horizontal plane;

means operatively associated with said base for depositing a resin fillet on said master in a direction transverse to the direction of movement of said pressure roller, wherein said pressure roller is movable in a direction transverse to said resin fillet so as to gradually bring together said film and said master while moving away from the zone where said resin fillet is deposited and so as to form said disc; and

roller means positioned adjacent said base for loosening said substrate from said master during return movement of said pressure roller.

4,407,647

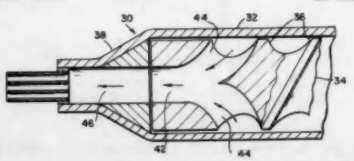
SOAP PLODDER FOR ELIMINATION OF WET CRACKING

Rudolph E. Denzler, Stirling, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,716

Int. Cl.³ B29F *3/06*

U.S. Cl. 425—208 **11 Claims**



1. A soap plodder to reduce surface cracking in soap consisting essentially of a barrel, a delivery head connected to said barrel, a worm operating in the barrel for mixing and advancing soap toward said delivery head, said delivery head having a cylindrical exit orifice, said worm having a bore therein communicating with said orifice having at least one hole therein extending from the periphery thereof towards and communicating with said central bore for feeding soap through said bore into said orifice wherein said bore and said orifice are of the same diameter.

4,407,648

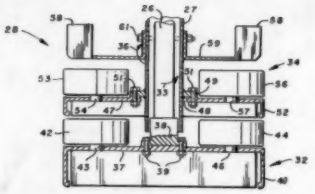
COUNTER ROTATING PACKERHEAD ASSEMBLY

Navarro T. Fosse, Nashua, Iowa, assignor to Hydrotile Machinery Company, Nashua, Iowa

Division of Ser. No. 188,301, Sep. 18, 1980, Pat. No. 4,340,553, which is a continuation-in-part of Ser. No. 974,303, Dec. 29, 1978. This application Apr. 9, 1982, Ser. No. 366,870

Int. Cl.³ B28B *21/26, 1/28*

U.S. Cl. 425—457 **26 Claims**



1. A counter rotating packerhead assembly for use with a machine to make a concrete product comprising: a rotatable lower packerhead unit having a plurality of first rollers with outer portions thereof operable to pack concrete into the annular space between the lower packerhead unit and the mold, means rotatably supporting the first rollers for rotation about separate axes extended generally parallel to the axis of rotation of the lower packerhead unit, said means including plate means and means rotatably mounting the first rollers on the plate means and locating the first rollers above the plate means, a rotatable upper packerhead unit located above said lower packerhead unit, said first rollers being disposed immediately below said upper packerhead unit with no intermediate structure therebetween, said upper packerhead unit having a plurality of second rollers, each of said second rollers having outer portions operable to pack concrete in an annular space surrounding the upper packerhead unit, said outer portions of the second rollers being located radially inwardly of the outer portions of the first rollers, means rotatably supporting the second rollers for rotation about separate generally upright axes extended parallel to the axis of rotation of the upper packerhead unit, means fixedly mounting a finned impeller to said upper packerhead unit for rotation therewith, said upper packerhead unit having annular trowel means located between said first and second rollers, said trowel means having outer means located radially inward of said outer portions of the first and second rollers for troweling the concrete between the first and second rollers and metering concrete directly to the first rollers of the lower packerhead unit.

4,407,649

INJECTION MOLDING MACHINE

Hiroji Saito, Sagamihara, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,969

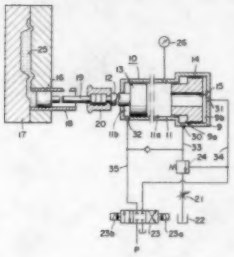
Claims priority, application Japan, Jan. 2, 1981, 56-15264

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—145 **5 Claims**

1. An injection molding machine comprising an injection piston-cylinder mechanism including therein an injection piston and a booster piston located at a rear portion of said injec-

tion piston and provided with a central longitudinal through hole, first valve means connected to a pressurized fluid source and said injection piston-cylinder mechanism so that the pressurized fluids supplied into said injection piston-cylinder mechanism passes through said through hole of said booster piston and acts on said injection piston thereby to fill a mold cavity of



a mold with molten bath, and a second valve means connected to said injection piston-cylinder mechanism which operates to discharge pressurized fluid in a cylinder chamber between said booster piston and said injection cylinder into a tank at a time when a fact that the molten bath injected into said molted cavity produces a predetermined condition is detected thereby to move said booster piston in a controlled manner.

4,407,650

ADJUSTABLE SEAL FOR GLASS SHEET FURNACE

Robert J. Greenler, 29071 Belmont Lake Rd., Perrysburg, Ohio 43551

Filed Apr. 5, 1982, Ser. No. 365,696
Int. Cl.³ F27D *1/18;* F27B *25/00;* C03B *18/00*
U.S. Cl. 432—242 **15 Claims**

1. In a furnace including a heating chamber, a horizontal conveyor for conveying glass sheets through the furnace for heating thereof within the heating chamber while being conveyed along a general horizontal plane, and a horizontally elongated access opening to the heating chamber along the plane of conveyance through the furnace, an adjustable seal for the access opening comprising: an elongated ceramic seal member of fused silica having a rotational axis extending along the length thereof; a support that rotatably mounts the ceramic seal member about its rotational axis above the access opening of the furnace; and the ceramic seal member having an elongated portion that moves toward and away from the plane of conveyance upon rotation of the seal member to thereby control the size of the opening.

4,407,651

HYBRID REHEATING SYSTEM AND METHOD FOR POLYMER PREFORMS

Martin H. Beck, Brookline; Suppayan M. Krishnakumar, Nashua, both of N.H., and Wayne N. Collette, Canton, Conn., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Feb. 5, 1982, Ser. No. 345,997
Int. Cl.³ F27D *3/00;* F27B *9/14, 9/06*
U.S. Cl. 432—11 **18 Claims**

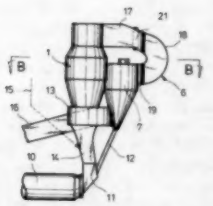
1. A hybrid heating system for reheating polymer tubular preforms, said heating system comprising at least one first type heating means for heating preforms in a manner wherein an interior surface of a wall of each preform is heated to a higher temperature than an exterior surface of that wall, and at least one second type of heating means for heating preforms in a manner wherein an exterior surface of a wall of each preform is heated to a higher temperature than an interior surface of that wall, whereby a desired temperature profile through a preform may be obtained, all of said heating means being disposed completely externally of a preform to be heated.

4,407,652

APPARATUS FOR CALCINING RAW MATERIALS IN THE FORM OF POWDER OR PARTICLES

Toshikazu Ichiyanagi; Kanzaburo Sudoh, both of Kumagaya; Keisuke Ogawa, Yotsukaido, and Nobuhiro Yamazaki, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Chichibu Cement Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 326,049
Claims priority, application Japan, Dec. 15, 1980, 55/175794
Int. Cl.³ F27B *15/00*
U.S. Cl. 432—58 **5 Claims**



1. A calcining furnace for producing a vortex of upwardly spiraling gases with entrained particulate matter, comprising:

(a). lower, central and upper sections which are connected and open to each other and have a common vertical axis,

(b). means at the lower part of the furnace for forming an upwardly and radially outwardly moving spiral of of gases and particulate matter, comprising

i. the lower section being of inverted frusto-conical shape,

ii. a chamber connected to the lower end of the lower section and shaped to impart a swirling motion to gases introduced into it,

iii. means for introducing into the swirling chamber gases and entrained particulate matter,

(c). means for forming an upwardly moving vortex from gases and entrained particulate matter moving upwardly from the lower section, comprising:

i. the central section being of cylindrical shape and having the same internal diameter as the upper end of the lower section,

(d). means at the upper end of the furnace for increasing the

velocity of the swirling gases rising from the central section and forcing them radially inwardly, comprising:

i. the upper section being frusto-conical in shape, and

(e). a chamber above and open to the upper section which is so formed that gases and entrained particulate matter which enter from the upper section are giving a swirling motion, and

(f). an outlet duct leading from the swirling chamber at the top of the upper section.

4,407,653

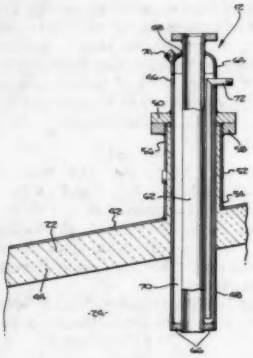
APPARATUS FOR HEATING SOLID HEAT-CARRYING BODIES

John F. Nutter, Encino, Calif., assignor to Tosco Corporation, Los Angeles, Calif.

Filed Nov. 19, 1981, Ser. No. 322,894

Int. Cl.[3] F27B *15/00*; F26B *17/12*

U.S. Cl. 432—215 8 Claims



1. An apparatus for heating solids comprising:

a heater shell having a roof, sides and a bottom defining a solids heating chamber; a removable feed conduit passing through said heater shell, said conduit having an inlet portion outside said heating chamber, an outlet portion inside said heating chamber and a mid portion therebetween, wherein solids are passed through said feed conduit into said heating chamber for heating;

a mounting tube having a bottom end integrally attached to said heater shell and a top end, said mounting tube having an inside diameter large enough for said feed conduit to pass therethrough;

a first flange extending radially outward from the mounting tube top end;

a second flange extending radially outward from said feed conduit mid portion, said second flange being adapted to releasably seat upon said first flange to position said feed conduit within said mounting tube and heating chamber;

means for heating said solids within said heating chamber; and

means for removing the heated solids from the heating chamber.

4,407,654

HANDLING AND SUPPORT SYSTEM FOR KILN FIRED WARE

David M. Irwin, East Liverpool, Ohio, assignor to The Potters Supply Company, East Liverpool, Ohio

Filed Jan. 21, 1982, Ser. No. 342,032

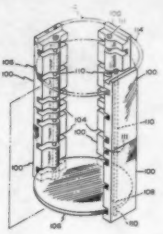
Int. Cl.[3] F27D *5/00*

U.S. Cl. 432—258 18 Claims

1. Apparatus for handling and supporting ware which is subjected to firing during production, said apparatus comprising:

ware supporting means adapted to receive and support said ware;

vertical support means for receiving and supporting said ware supporting means so that ware placed on said ware supporting means are separated and spaced apart from one another, said ware supporting means and said vertical



support means each including apertures formed therein which apertures align with one another when said ware supporting means is received within said vertical support means; and

locking means received within said aligned apertures for locking said ware supporting means to said vertical support means to form a framework for handling and supporting articles for firing.

4,407,655

DEVICE FOR SIMULATION OF PROJECTED IMAGE

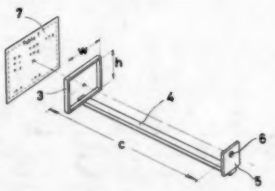
Yoshio Koda, Nagoya, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,472

Claims priority, application Japan, Mar. 18, 1981, 56-38879; Jul. 10, 1981, 56-108555

Int. Cl.[3] G09B *19/00*

U.S. Cl. 434—219 11 Claims



1. A device for simulation of projected image, comprising a support member, a frame disposed at one end of said support member substantially perpendicularly to said support member, and an eye member provided with an eye hole and disposed at the other end of said support member substantially perpendicularly to said support member and parallelly to said frame, the inner vertical dimension of said frame being what is obtained by multiplying the vertical dimension of the area of a projected image by the distance between said frame and said eye member and dividing the resultant product by the distance between the surface of the projected image on the screen and the position suitable for observation of the projected image and the inner horizontal dimension of said frame being what is obtained by multiplying the horizontal dimension of the area of the projected image by the distance between said frame and said eye member and dividing the resultant product by the distance

between the surface of the projected image on the screen and the position suitable for observation of the projected image.

4,407,656

GETTERING DEVICE AND METHOD

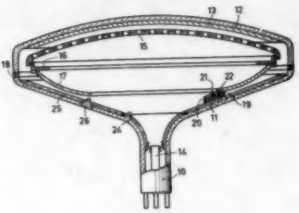
Franz Hofer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1981, Ser. No. 261,993

Claims priority, application Netherlands, May 16, 1980, 8002836

Int. Cl.³ H01J 9/20

U.S. Cl. 445—10 **12 Claims**



1. A method of manufacturing a colour television display tube having an envelope comprising a conical portion and a window portion which are sealed together in a vacuum-tight manner by means of a sealing glass, a gettering device being provided in a place situated inside the envelope of the tube before said portions are sealed together, said gettering device comprising a source of evaporable gettering metal and at least one gas source including a material which releases gas upon heating, the gas being released from the gas source after evacuating the display tube and while the gettering metal is evaporated, characterized in that said gas-releasing material comprises a nitrided pulverulent ternary alloy of iron, germanium and at least one of the metals chromium and manganese.

7. A gettering device comprising a source of evaporable gettering metal and at least one gas source including gas-releasing material in powder form, characterized in that said gas-releasing material comprises a nitrided pulverulent ternary alloy of iron, germanium and at least one of the metals chromium and manganese.

4,407,657

GETTERING DEVICE AND METHOD

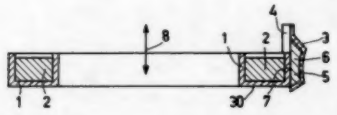
Jan J. B. Fransen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1981, Ser. No. 262,003

Claims priority, application Netherlands, May 16, 1980, 8002837

Int. Cl.³ H01J 9/20

U.S. Cl. 445—17 **12 Claims**



1. A method of manufacturing a picture display tube comprising installing in the tube a gettering device holding a gas releasing material and an evaporable gettering metal, sealing and evacuating the tube, and applying an electromagnetic field to the device to induce therein an electrical heating current to effect release of the gas and evaporation of the gettering metal, characterized in that said gettering device includes a first metallic holder containing the evaporable gettering metal and a second metallic holder containing the gas-releasing material, said second holder being attached to a predetermined position on the first holder's outer surface where the electrical current of greatest magnitude is induced, for shunting sufficient electrical current from the first holder to effect heating of the material held in the second holder to its gas-releasing temperature before the gettering metal held in the first holder is heated to its evaporation temperature.

8. A gettering device for inductively heating and dispersing a gas and a gettering metal in an evacuated envelope, when an electrical heating current is induced in the device by means of an applied electromagnetic field, said device comprising a first metallic holder for an evaporable gettering metal and a second metallic holder for a gas-releasing material,

characterized in that said second holder is attached to a predetermined position on the first holder's outer surface where the electrical current of greatest magnitude is induced, for shunting sufficient electrical current from the first holder to effect heating of the material held in the second holder to its gas-releasing temperature before the gettering metal held in the first holder is heated to its evaporation temperature.

4,407,658

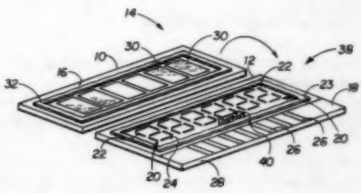
GAS DISCHARGE DISPLAY DEVICE SEALING METHOD FOR REDUCING GAS CONTAMINATION

Anthony J. Bernot, Gilbert, and Kenneth Brown, Tempe, both of Ariz., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 2, 1981, Ser. No. 239,292

Int. Cl.³ H01J 9/18

U.S. Cl. 445—25 **6 Claims**



1. A method for constructing a gas discharge display device having a face plate and a base plate forming an interior envelope with a viewing window and containing electrode means, said method comprising the steps of:

forming a perimeter seal around said viewing window of said display on at least one of said plates;

placing spacer means on one of said plates;

assembling said plates in face-to-face relation to form said envelope;

maintaining with said spacer means the majority of said perimeter seal out of contact with the other of said plates to provide a gap between said perimeter seal and said other of said plates;

placing said assembled plates in a vacuum furnace;

heating said furnace to a first temperature range to soften said perimeter seal;

outgassing contaminants from said electrode means and from said perimeter seal;

simultaneously with said first temperature heating step creating a vacuum in said furnace to remove said contaminants through said gap and out of the atmosphere between said plates;

introducing an ionizable gas between said plates;

heating said furnace to a second temperature range higher than said first temperature range to melt said spacer means; and

moving said plates in contact with each other around said perimeter seal to establish a hermetically sealed display.

4,407,659

DRIVE SYSTEM

Leslie E. S. Adam, Doncaster, Australia, assignor to Varian Associates, Inc., Palo Alto, Calif.

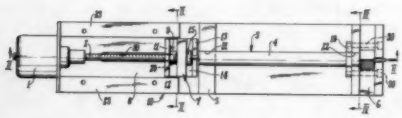
PCT No. PCT/AU81/00069, § 371 Date Jan. 28, 1982, § 102(e) Date Jan. 28, 1982, PCT Pub. No. WO81/03545, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 5, 1981, Ser. No. 346,073

Claims priority, application Australia, Jun. 6, 1980, PE3939

Int. Cl.³ A61M 5/20

U.S. Cl. 604—155 6 Claims



1. A syringe drive system including,

a support structure,

means on said support structure for receiving and holding a syringe against axial movement,

a drive motor having a body and a drive shaft which moves axially relative to said body in response to energization of said motor,

said drive motor body being secured to said support structure against movement relative thereto and so that said drive shaft is substantially coaxially with a said syringe secured to said support structure,

coupling means connected directly to an end of said drive shaft for movement therewith relative to said support structure,

said coupling means being directly connectable to the plunger of a said syringe to cause axial movement thereof in response to said axial movement of the drive shaft, and

means holding said shaft against rotation relative to said support structure.

4,407,660

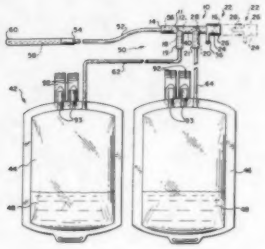
PLASMAPHERESIS ASSEMBLY AND ASSOCIATED FLUID MANIFOLD

Charles Nevens, Barrington, and Ronald A. Williams, Mundelein, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Sep. 8, 1981, Ser. No. 300,338

Int. Cl.³ A61M 5/00

U.S. Cl. 604—6 18 Claims



1. A blood collection assembly comprising

primary conduit means including, at one end thereof, a phlebotomy needle,

first and second blood collection containers,

first and second auxiliary conduit means respectively attached in fluid communication with said collection containers, and

a fluid manifold interconnecting said primary conduit means and said first and second auxiliary conduit means, said manifold including

a main passage having a portion attached in flow communication with said primary conduit means and a portion normally open to communication with the atmosphere and accommodating attachment to a recipient set for conducting fluids into said main passage,

a pair of branch passages joining said main passage in a spaced-apart relationship and being attached in flow communication with a respective one of said first and second auxiliary conduit means, and

a plug removably insertable through said normally open portion of said main passage and into the interval between the junctions of said spaced apart branch passages with said main passage, said plug including a cap portion which, when said plug is inserted, sealingly occupies and closes said normally open portion, said plug further including a stem portion which, when said plug is inserted, sealingly occupies and closes said main passage in said interval for blocking flow communication between said branch passages through said main passage.

CHEMICAL

4,407,661
MOTOR FUEL ADDITIVES DERIVED FROM SHALE OIL

Serge R. Dolhyj, Parma, and Christos Paparizos, Willowick, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Dec. 7, 1981, Ser. No. 327,831
Int. Cl.³ C10L 1/18
U.S. Cl. 44—78 **5 Claims**

1. A motor fuel comprising a blend of:

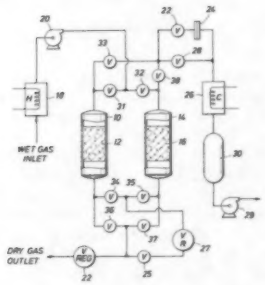
A. A mixture of hydrocarbons boiling within the gasoline range, and

B. An etherified mixture of phenols, the phenols obtained from retorted shale oil.

4,407,662
METHOD OF REMOVING WATER FROM ETHANOL

William F. Ginder, Houston, Tex., assignor to Ad-Pro Industries, Inc., Houston, Tex.

Continuation of Ser. No. 198,370, Oct. 20, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,612
Int. Cl.³ B01D 3/00, 53/04
U.S. Cl. 55—33 **5 Claims**



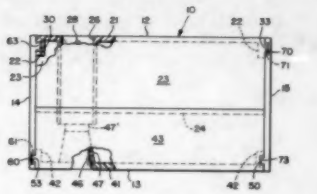
1. A method of removing sufficient water from H_2O ethanol at least 160 proof to produce ethanol having a proof of 195 or more comprising the steps of heating the ethanol water mixture until it is a vapor with sufficient superheat to maintain the vapor phase and prevent substantial capillary adsorption as the mixture passes through a dessicant bed of molecular sieves, passing the superheated ethanol water mixture through the bed to remove sufficient water to increase the proof of the ethanol to at least 195, passing a portion of the dehydrated ethanol through a second dessicant bed of molecular sieves at less than atmospheric pressure to desorb the water and ethanol on the dessicant from a previous dehydration cycle, and reversing the flow through the two beds after the temperature of the bed increases no more than about 14° C. (25° F.).

5. A method of dehydrating ethanol to 195 proof or higher comprising the steps of heating the ethanol to 99°–110° C. (210°–230° F.) at a pressure of 2–10 PSIG, passing the gaseous ethanol through a first dessicant bed of 3A molecular sieves with sufficient superheat to prevent substantial capillary adsorption as the mixture passes through said bed, for 2–10 minutes where a portion of the water and the ethanol is adsorbed by the dessicant bed, passing a portion of the dehydrated gaseous ethanol through a second dessicant bed of 3A molecular sieves at 5–10 PSIA to desorb the water and ethanol adsorbed by the bed previously when gaseous ethanol was passed through the bed at 99°–110° C. (210°–230° F.) and 2–10 PSIG pressure, diverting the flow of the gaseous ethanol to the second bed and the flow of the desorbing ethanol to the first bed at the end of the 2–10 minute cycle, and repeating the diverting step at the end of each 2–10 minute cycle such that the temperature of the first bed increases no more than about 14° C. (25° F.).

4,407,663
MODULAR SPIN FILTERS AND HOUSING THEREFOR

Clyde W. Hawley, Fairport, N.Y., assignor to Dollinger Corporation, Rochester, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,749
Int. Cl.³ B01D 45/12
U.S. Cl. 55—347 **10 Claims**



8. A modular spin filter comprising

a pair of front and rear sections positioned in operative engagement with each other,

a pair of end panels releasably secured to opposite ends of said front and rear sections to secure said sections releasably in their operative positions, and

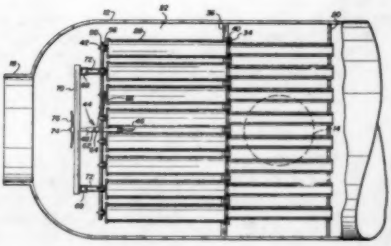
means for conveying a gas, which is to be filtered, from gas inlet openings in one of said sections to gas discharge openings in the other of said sections, including means for centrifugally removing particles from the gas as it passes between said sections,

each of said end panels being releasably connected to said sections by tongue and groove connecting means permitting each panel to be manually shifted relative to said sections in one direction to connect the panel to said sections and in the opposite direction to disconnect the panel from said sections.

4,407,664
MULTIPLE FILTER VESSEL

Donald A. Sillers, Jr., Dallas, Tex., assignor to Peerless Manufacturing Company, Dallas, Tex.

Division of Ser. No. 103,857, Dec. 14, 1979, Pat. No. 4,298,474. This application Jul. 13, 1981, Ser. No. 282,855
Int. Cl.³ B01D 46/10
U.S. Cl. 55—357 **2 Claims**



1. In a horizontally disposed filter vessel having an inlet and outlet port the combination of:

an elongated filter element having a first end with an opening fitted against a flow directing member so the gas passing through the element may enter the member and a second closed end; and

a mast structure within the vessel and having an opening for supporting said second closed end such that said elongated filter element is substantially horizontally disposed within said filter vessel;

said second end of the elongated filter element comprising a cap sealingly secured to and closing the second end of the

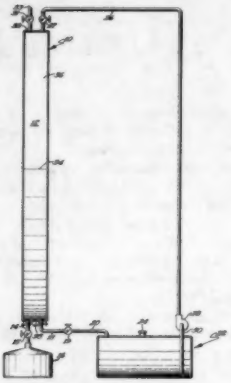
filter element, said cap having a pointed stud extending therefrom which can be grasped by a human hand to manipulate the filter element to which the cap is attached into a horizontal position so as to align said first open end with said flow directing member supporting the second end of the filter element on the mast means.

4,407,665

LIQUID DEGASIFICATION DEVICE

Henry C. Lasater, Box 616, Cuba, N. Mex. 87013

Filed Mar. 24, 1980, Ser. No. 132,888
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—55 6 Claims



1. An apparatus for the degasification of water, said apparatus comprising:

a degasification column for removal of dissolved gases which are in solution with water and having a top and a bottom, said column having a length exceeding the height of the water which would be supported within the column by atmospheric pressure when the top of the column is in substantially evacuated condition;

a water reservoir;

means for venting gases from the top of said column;

means for selectively sealing said venting means;

means for selectively draining degassed water from said column

means for selectively connecting said column to said reservoir for controlling water flow therebetween; and

a container under a vacuum and connected with said means for selectively draining degassed water to receive and retain degassed water.

4,407,666

METHODS FOR PROLONGING THE USEFUL LIFE OF A GRAPHITE ELEMENT IN AN OPTICAL FIBER-DRAWING FURNACE

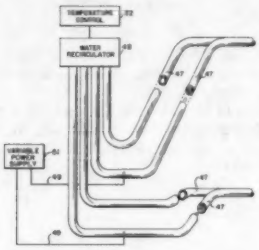
Alfred D. Briere, Dudley, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 31, 1981, Ser. No. 298,059
Int. Cl.³ C03B *37/07, 37/01*
U.S. Cl. 65—2 12 Claims

1. A method for using an optical fiber-drawing furnace, including a graphite element of generally cylindrical shape with a reduced central cross-sectional configuration having a flange at opposite ends thereof and having an axial hole therethrough including a central internal element chamber for receiving a glass preform, means for water cooling said flanges, and means for applying electric power across said flanges to resistively heat said reduced central cross-sectional configuration and, hence, said central internal element chamber so that an optical fiber can be drawn from said preform, said method prolonging the useful life of said graphite element and comprising

a. regulating the water used for cooling said flanges to a temperature substantially in excess of the dew point of the ambient atmosphere in which said furnace is located so that atmospheric moisture does not condense thereupon and to a temperature not in excess of 98.6° Fahrenheit so that said flanges can be cooled to a temperature not in excess of average normal human body temperature; and

b. avoiding thermal shock to said graphic element by raising the temperature of said chamber of a cold graphite element through the application of electric current by said



power means at a gradually increasing rate not in excess of one thousand amperes per three minutes until said chamber has achieved an operating temperature of 1900° C. to 2300° C., operating said furnace and producing drawn optical fiber with said chamber maintained at said operating temperature, and gradually lowering the temperature of said chamber of said graphite element by diminishing the application of current therethrough at a decreasing rate not in excess of one thousand amperes per three minutes until said chamber has achieved a bakeout temperature which is high enough to prevent moisture from entering said axial hole of said graphite element.

4,407,667

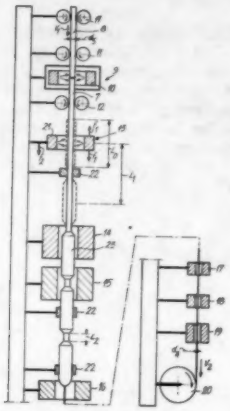
METHOD AND APPARATUS FOR FABRICATING OPTICAL FIBERS

Georges Le Noane, Kerrougant Bras, 22730 Tregastel, and Daniel Boscher, Kerariou, 22560 Tregastel, both of France

Filed Jul. 20, 1981, Ser. No. 284,961
Claims priority, application France, Jul. 31, 1980, 80 17005
Int. Cl.³ C03B *20/00, 37/025*
U.S. Cl. 65—3.11 10 Claims

1. A process for continuous manufacture of optical fibers, comprising the steps of advancing successive cylindrical bars of homogeneous silica-base material in end to end relation along a predetermined path; welding each of said bars to a preceding one of said bars as the rear end of said preceding bar is advanced past a welding location to form a train of bars along said path; progressively applying on each of said bars a silica cladding containing a proportion of index varying dopant which varies as the diameter of the cladding increases as it passes through a cladding zone so as to form successive welded and clad preforms; and drawing out each one of the welded and clad preforms in turn to the fiber diameter as said train

advances, whereby lengths of optical fibers are obtained each corresponding to one of said preforms which have a core of



constant index surrounded by an annular portion of variable index.

4,407,668

APPARATUS AND PROCESS FOR PRODUCING A CLADDED OPTICAL FIBER HAVING A LONGITUDINAL SIDE COUPLING ZONE

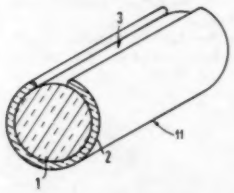
Hubert Aulich, and Franz Auracher, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 944,366, Sep. 21, 1978, Pat. No. 4,355,863. This application May 21, 1982, Ser. No. 380,817

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744129

Int. Cl.³ C03B *5/26, 19/00, 37/025*

U.S. Cl. 65—3.11 **4 Claims**



1. A process for the production of glass fiber having a core of glass surrounded by a cladding layer of glass with an index of refraction lower than the index of refraction of the glass of the core, said fiber having a longitudinally extending opening in the cladding layer to expose a portion of the core, said process comprising providing a workpiece having a rod member with a sleeve-like layer of the cladding, said sleeve-like layer having an opening to expose a portion of the rod member, heating said workpiece to a drawing temperature and then drawing said workpiece into said fiber having a cladding layer with a longitudinal extending opening exposing a portion of the core.

4. In an apparatus for producing glass fiber having a core of a glass material and a cladding layer of a glass having an index of refraction less than the index of refraction of the glass material of said core, said apparatus comprising a double crucible with the inner crucible having means defining an opening defining a core, said opening of the inner crucible being axially aligned with means defining an opening in the outer crucible for the cladding material to form a drawing nozzle, the improvement comprising the opening in the inner crucible being arranged concentrically to the opening of the outer crucible and having at least one bulge extending at least to an edge of the opening of the outer crucible so that a cladded fiber drawn therethrough has a gap in the cladding layer through which the core is exposed.

4,407,669

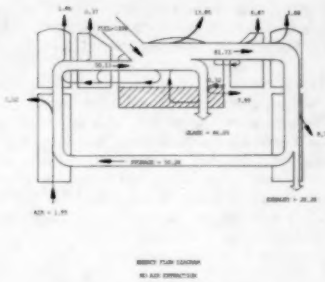
WASTE HEAT RECOVERY FROM REGENERATIVE FURNACES

Frederick J. Nelson, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 15, 1982, Ser. No. 368,597

Int. Cl.³ C03B *5/16*

U.S. Cl. 65—134 **13 Claims**



1. A method of operating a regenerative furnace of the type having a pair of checkerworks used alternately on the exhaust side and inlet side of said furnace, to capture a greater portion of its waste heat, comprising the steps of introducing a substantial volume of air into the checkerworks at one side of a regenerative furnace, the volume of which is greater than that required for complete combustion, passing this entire volume of air as a unitary stream through at least a first portion of the one side of the hot checkerworks of the regenerative furnace to preheat the air and substantially increase the sensible heat of the air, diverting a portion of the preheated air from the said one side of the checkerworks in advance of the combustion zone to an auxiliary heat-utilizing apparatus mounted exteriorly of said furnace, conducting the remainder portion of the preheated air to the combustion zone of the said furnace to achieve combustion of a combustible fuel, conducting all of the combustion exhaust through the exhaust side checkerworks to thereby heat the checkerworks, and adjusting the flow paths at predetermined intervals to reverse the regenerative flow system and recover heat from the other side on reversal.

4,407,670

BIOCIDAL COMPOUNDS AND COMPOSITIONS

Trevor A. Crabb; Graham C. Jackson, both of Portsmouth, and Philip A. Jupp, Petersfield, all of England, assignors to National Research Development Corporation, London, England

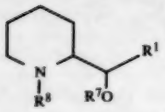
Filed Feb. 23, 1981, Ser. No. 237,108

Claims priority, application United Kingdom, Feb. 28, 1980, 8006772

Int. Cl.³ A01N *43/00, 43/40, 43/76*

U.S. Cl. 71—67 **5 Claims**

1. A composition for inhibiting algal, barnacle and fungal growth in aquatic environments consisting essentially of a biocidally effective amount of an active component which is a synthetic heterocyclic compound of the structure:



wherein

R^1 is an alkyl radical containing 8, 10 or 12 carbon atoms and R^7 and R^8, when taken separately, are hydrogen atoms or, when taken together, are $—CH_2—$, in conjunction with an acceptable diluent or carrier.

4,407,671

USE OF 3-AMINOCYCLOHEXADIENECARBOXYLIC ACIDS FOR CONTROLLING THE GROWTH OF UNWANTED PLANTS

Dennis H. Flint, and Herbert Estreicher, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1982, Ser. No. 447,379
Int. Cl.³ A01N *37/08*
U.S. Cl. 71—113 **1 Claim**

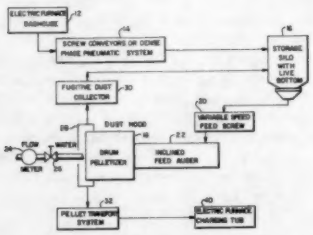
1. A method for controlling growth of unwanted plants at a locus which comprises applying to that locus an effective amount of a 3-aminocyclohexadienecarboxylic acid in which the carbon atom of the ring to which the carboxyl moiety is bonded is olefinically unsaturated, and the carbon atom of the ring to which the amino moiety is bonded is saturated, an alkali metal, alkaline earth metal, ammonium or amine salt, or a C_1–C_6 alkyl ester, of such an acid.

4,407,672

METHOD FOR THE RECOVERY OF IRON UNITS FROM FLUE DUST GENERATED IN A STEEL MAKING PROCESS

Roger A. Deuschle, Villanova, and Charles P. Mueller, King of Prussia, both of Pa., assignors to International Mill Service, Inc., Philadelphia, Pa.

Filed Jun. 24, 1981, Ser. No. 276,977
Int. Cl.³ C21C *5/52*; C21B *3/04*; C22B *1/248*
U.S. Cl. 75—10 R **9 Claims**



1. A method of making a melt utilizing flue dust in a steel making process, consisting essentially of the steps of:

collecting the dust generated in the steel making process;

agglomerating the collected dust into green ball pellets in a pelletizing apparatus;

loading the pellets into an electric arc furnace charging bucket by placing the pellets at or near the bottom of the charging bucket and covering the pellets with steel scrap separate from the pellets; and

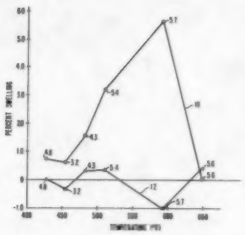
charging an electric arc furnace with the pellets and the steel scrap in the charging bucket only after the furnace has been previously charged with steel scrap without said pellets to form a melt, whereby when the pellets are charged into the melt, the pellets are immediately submersed into the melt by the steel scrap to minimize fume-off of pellet material.

4,407,673

SOLID SOLUTION STRENGTHENED DUCT AND CLADDING ALLOY D9-B1

Michael K. Korenko, Rockville, Md., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Continuation of Ser. No. 110,525, Jan. 9, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,340
Int. Cl.³ C22C *38/40*
U.S. Cl. 75—128 A **12 Claims**



1. An austenitic iron base alloy characterized by improved microstructural stability and swelling resistance superior to AISI type 316 stainless steel in a neutron irradiation atmosphere, said alloy consisting essentially of from about 14% to about 16% nickel, from about 12% to about 14% chromium, from about 1.2% to about 1.7% molybdenum, from about 0.5% to about 1.1% silicon, from about 1.5% to about 2.5% manganese, up to 0.1% zirconium, from about 0.2% to about 0.5% titanium, from about 0.02% to about 0.1% carbon, up to 0.01% boron and the balance iron with incidental impurities.

4,407,674

NOVEL ELECTROCONDUCTIVE COMPOSITIONS AND POWDER FOR USE THEREIN

John E. Ehrreich, Wayland, Mass., assignor to Ercon, Inc., Waltham, Mass.

Division of Ser. No. 126,681, Mar. 3, 1981, Pat. No. 4,319,920. This application Oct. 2, 1981, Ser. No. 308,242
Int. Cl.³ B22F *1/00*
U.S. Cl. 75—251 **10 Claims**

1. A silver powder product formed of nonplanar, essentially flake-shaped particles, wherein said particles which are characterized by an average thickness of less than about 0.2 micron thick and further characterized by a bulk density of from 0.15 to 0.85 gram per cc.

4,407,675

COMPOSITION FOR PRESERVING DENTAL PULP

Milton Hodosh, 72 Overhill Rd., Providence, R.I. 02906

Division of Ser. No. 126,433, Mar. 3, 1980, Pat. No. 4,343,608. This application Jun. 24, 1982, Ser. No. 391,728
Int. Cl.³ A61K *6/08*
U.S. Cl. 106—35 **6 Claims**

1. A pulp capping composition comprising a vehicle capable of hardening to a cement-like consistency selected from the group consisting of a mixture of zinc oxide and eugenol and a mixture of zinc oxide and polyacrylic acid and, as the essential

ingredient, an effective amount of potassium nitrate sufficient to prevent pulp degeneration and abscess formation.

4,407,676

FIBER-REINFORCED CEMENT AND PROCESS

Jose M. Restrepo, Calle 85 No. 14-70, of. 301, Bagota, Colombia

Continuation-in-part of Ser. No. 325,035, Nov. 25, 1981. This application Jul. 2, 1982, Ser. No. 394,785

Int. Cl.³ C04B 21/00

U.S. Cl. 106—88 20 Claims

1. A cement mortar comprising separate reinforcing filaments obtained from polyolefin film, said separate filaments consisting in sections shredded from non-twisted fibrillated ribbons having a length of up to 50 mm long, with said fibrillated ribbons having been split apart from said polyolefin film, wherein said separate reinforcing filaments have filamentary structure comprising hooked microfibrils outwardly projecting from points along the length of said separate filaments, and wherein separate reinforcing plastic filaments are microfibrillated and evenly distributed throughout the body of said cement mortar in a randomly oriented fashion along all of its special directions by high-speed stirring, and wherein gas bubbles or chunks of a cellular plastic are evenly and randomly distributed throughout said body of cement mortar.

4,407,677

CONCRETE MASONRY UNITS INCORPORATING CEMENT KILN DUST

Milton H. Wills, Jr., Catonsville, Md., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 5, 1982, Ser. No. 365,425

Int. Cl.³ C04B 7/35

U.S. Cl. 106—97 7 Claims

1. A composition for the manufacture of concrete block, comprising aggregate, cement, and cement kiln dust, wherein the aggregate is present in a proportion of between about 8 to about 12 parts to 1 part of a mixture of cement and cement kiln dust.

4,407,678

SLUDGE REMOVAL MACHINE

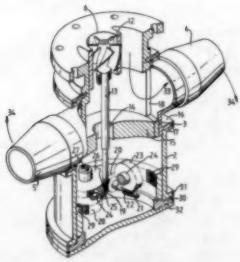
John A. Furness, Addiscombe, and John Haggerty, Warlingham, both of England, assignors to Butterworth Systems Inc., Florham Park, N.J.

Filed Sep. 11, 1981, Ser. No. 301,414

Claims priority, application United Kingdom, Sep. 12, 1980, 8029639

Int. Cl.³ B08B 3/02, 9/08

U.S. Cl. 134—167 R 11 Claims



1. A machine suitable for removing sludge from the bottom of a storage tank which comprises a central body, a casing rotatable about said body and provided with two substantially diametric nozzles arranged so that liquid emerging therefrom sweeps substantially only in one plane, a turbine for rotating the casing about the central body and means ensuring that when the casing is continuously rotated, alternately one nozzle is closed for substantially 180° rotation whilst the other nozzle is open.

4,407,679

METHOD OF PRODUCING HIGH TENSILE ALUMINUM-MAGNESIUM ALLOY SHEET AND THE PRODUCTS SO OBTAINED

Carmen C. Manzonelli, Corapolis, Pa., and David A. Chatfield, Michigan City, Ind., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Nov. 19, 1980, Ser. No. 208,485

Int. Cl.³ C22F 1/04

U.S. Cl. 148—2 16 Claims

1. The method of making a high tensile aluminum-magnesium alloy sheet product comprising

forming an aluminum-magnesium alloy melt consisting essentially of 0.15–0.45% silicon, 0.10–0.90% iron, 1.5–2.3% magnesium and the remainder aluminum,

continuously forming from the melt a sheet of aluminum-magnesium alloy having a uniform thickness between 0.125 and 0.5 inch,

providing the aluminum-magnesium alloy sheet quenched to a temperature below 500° F., the quenching taking place in not more than about three minutes, and

cold reducing the quenched sheet straight down to an 80%–95% reduction in thickness without the application of extraneous heat to the sheet, to thereby obtain an aluminum-magnesium alloy sheet product having a yield and tensile strength in excess of 50,000 psi.

4,407,680

DUAL-PHASE STEELS

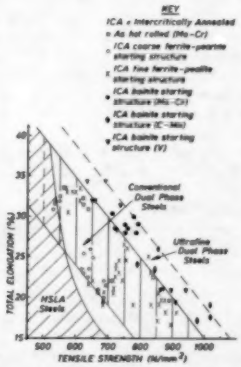
Terence Gladman, Swinton, and Nicholas K. Ballinger, Doncaster, both of England, assignors to British Steel Corporation, London, England

Continuation of Ser. No. 225,667, Jan. 16, 1981, abandoned. This application Mar. 25, 1982, Ser. No. 361,852

Claims priority, application United Kingdom, Jan. 18, 1980, 8001702

Int. Cl.³ C21D 8/02

U.S. Cl. 148—12 F 5 Claims

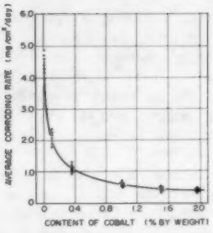


1. A process for producing a hot-rolled dual-phase low carbon steel in which steel strip is hot-rolled in a mill, cooled to exhibit a substantially uniform bainitic structure throughout its cross-section as it issues from the mill and in which the strip is subsequently transported through an annealing furnace and continuously annealed in the two-phase ferrite austenite field and cooled to transform some, or all, of the austenite to martensite.

4,407,681
HIGH TENSILE STEEL AND PROCESS FOR PRODUCING THE SAME

Katutoshi Ina; Kazuo Yamamoto; Hirokichi Higashiyama; Norio Ishikawa, and Hiroshi Miyoshi, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 158,135, Jun. 10, 1930, abandoned.
This application Jun. 9, 1982, Ser. No. 387,264
Claims priority, application Japan, Jun. 29, 1979, 54-81472; Aug. 8, 1979, 54-101020
Int. Cl.³ C21D *8/00*
U.S. Cl. 148—12 F **11 Claims**



1. A high tensile steel having excellent resistance to sulfide corrosion cracking and corrosion which steel has substantially a martensite structure and a yield strength of 60 to 81 kg/mm^2 and which steel has been prepared by hot- or cold-rolling a steel consisting essentially of, as indispensable components, 0.05% to 0.50% by weight of carbon, 0.1% to 0.28% by weight of silicon, 0.1% to 2.0% by weight of manganese, 0.05% to 1.50% by weight of cobalt, and the balance consisting of iron and inevitable impurities; said high tensile steel being produced by rapidly heating said rolled steel to a temperature of from 850° C. to 950° C. at a heating rate of 2° C./ sec or more to austenitize it; then quenching said austenitized steel by using water or oil; and tempering said quenched steel at a temperature not higher than Ac_1 point of said steel.

5. A process for producing a high tensile steel having substantially a martensite structure and a yield strength of 60 to 81 kg/mm^2 and exhibiting excellent resistance to sulfide corrosion cracking and corrosion, which comprises the steps of:

hot- or cold-rolling a steel consisting essentially of, as indispensable components, 0.05% to 0.50% by weight of carbon, 0.1% to 0.28% by weight of silicon, 0.1% to 2.0% by weight of manganese, 0.05% to 1.50% by weight of cobalt, and the balance consisting of iron and inevitable impurities;

rapidly heating said rolled steel to a temperature of from 850° C. to 950° C. at a heating rate of 2° C./ sec or more to austenitize it;

quenching said austenitized steel by using water or oil; and

tempering said quenched steel at a temperature not higher than the Ac_1 point of said steel.

4,407,682
METHOD OF PLASTIC WORKING OF METAL MATERIALS

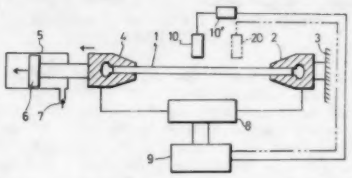
Shigeki Sawa, Nagoya; Hiroyasu Nagasaka, Chiryu; Makoto Saito, Nagoya; Masashi Mizuno, Aichi, and Katuhiro Kozima, Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Japan

Filed Mar. 29, 1981, Ser. No. 363,345
Claims priority, application Japan, Apr. 6, 1981, 56-51498; May 14, 1981, 56-72681; Jul. 24, 1981, 56-116688
Int. Cl.³ C21D *8/00*
U.S. Cl. 148—128 **9 Claims**

1. A method of plastic working of metal materials including the steps of:

(a) effecting changes in the temperature of a material to be plastically worked;

(b) determining variations in the metallographical condition of the material caused by the changes in the temperature of the material;



(c) detecting a sudden change in the metallographical condition of the material caused immediately before the material becomes superplastic; and

(d) starting a plastic working of the material after having detected the sudden change in the material.

4,407,683
STEEL FOR COLD PLASTIC WORKING

Toshio Hijikata, Fujisawa, and Kazuhiro Kawasaki, Hiratsuka, both of Japan, assignors to Neturen Company, Ltd., Tokyo, Japan

Division of Ser. No. 224,625, Jan. 12, 1981, Pat. No. 4,336,081, which is a division of Ser. No. 34,951, Apr. 30, 1979, abandoned.
This application Apr. 15, 1982, Ser. No. 368,847
Int. Cl.³ C21D *9/52*
U.S. Cl. 148—144 **10 Claims**

1. A process of preparing a cold plastic workable steel wire, which comprises heating a hardenable carbon steel wire, which contains at least 0.27% C, 0.15–2.2% Si and 0.61–1.65% Mn, by high-frequency induction to a temperature within the austenitic range for the hardenable carbon steel wire, quenching the thus heated steel wire, heating the quenched steel wire by high-frequency induction to between 300° and 600° C., stopping said heating, holding the steel wire for up to 60 seconds, and cooling the thus heated steel wire at a cooling rate of greater than 50° C./second to yield said cold plastic workable steel wire, having a tensile strength of greater than 150 Kgf/mm^2.

4,407,684
APPARATUS AND METHOD OF APPLYING AN ELONGATED STRIP TO A TIRE COMPONENT BUILDING DRUM

Ronald L. Budzowski, Munroe Falls, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Apr. 27, 1981, Ser. No. 258,201
Int. Cl.³ B29H *17/10*
U.S. Cl. 156—133 **9 Claims**

1. A method of feeding an elongated strip onto a tire component building drum, characterized by the improvement comprising the steps of:

(a) placing a roll of said strip on a roll support means on the side of said building drum intended for a person to stand while operating said drum and wrapping components of a tire onto said drum;

(1) after the step of placing said roll of strip on said roll support means, securing an end of said strip between rollers of a roller means located near the elevation of said roll support means,

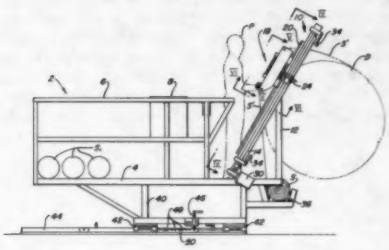
(2) moving said roller means up a track that is slanted toward said building drum to unwind said strip from said roll and carry said end of said strip upwardly and toward the location on said building drum where said strip is to be passed onto said drum, and

(3) stopping said roller means on said track and fixing said roller means at a location convenient for passing said strip over said roller means and onto said building drum;

(b) passing said strip over said roller means; and

(c) passing said strip from said roller means onto said building drum.

2. Apparatus for feeding an elongated strip onto a tire component building drum, that has a floor located adjacent to one lateral side of said drum for holding a person who operates said strip-feeding apparatus and said building drum, said strip-feeding apparatus including an elongated frame having track extending lengthwise of said frame, and a carriage mounted on



said track and movable along the length of said track means, said carriage being equipped with roller means for holding and conveying said elongated belt strip, characterized by the improvement comprising:

(a) said frame being mounted on said floor and located on same side of said building drum as said floor, said frame and said track extending upwardly from said floor and laterally toward said building drum;

(b) means mounted on said frame for driving said carriage up and down said track and for fixing the position of said carriage on said track at a location with respect to said building drum which is convenient for use in conveying and applying said elongated strip to said drum.

4,407,685

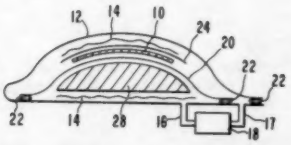
METALLIZED FILM TRANSFER PROCESS

Lawrence B. Hankland, Menlo Park, Calif., assignor to Ford Aerospace & Communication Corporation, Detroit, Mich.

Continuation of Ser. No. 59,807, Jul. 23, 1979, abandoned. This application May 4, 1981, Ser. No. 260,229

Int. Cl.³ B31F *1/00*; **B44C** *1/00*; **B29C** *17/00*; **B32B** *3/26*

U.S. Cl. 156—212 **1 Claim**



1. Method for applying a metal coating onto a composite object having a compoundly curved shape and having a high modulus fiber component and an adhesive component, wherein the adhesive component is from the class consisting essentially of thermoplastic adhesives and B-staged thermosetting adhesives; said method comprising the steps of:

depositing by vapor deposition a thin layer of said metal less than 0.0002 inches thick onto a fluorocarbon-based polymer release film to form a metallized film;

joining together several of said metallized films side-by-side to provide a single large metallized film having a sufficient size to cover said object;

placing said large metallized film against the composite object, with the metal side facing the composite object, in such a way that no additional adhesive agent is placed between said metal and said object;

in a vacuum formed by a single vacuum source, adhering said metal to said object while simultaneously applying pressure to said object and to said large metallized film so that said object is molded into said compoundly curved shape and coated with said large metallized film in same step; and

peeling said release film away from said metallized composite object leaving just said metal coating on said composite object.

4,407,686

INFLATABLE DEVICE FOR INSTALLING STRAIN GAGE BRIDGES

Clarence E. Cook, Lancaster; Glynn E. Smith, Quartz Hill, and Richard C. Monaghan, Pearblossom, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 17, 1981, Ser. No. 322,314

Int. Cl.³ E04B *2/00*; **E04F** *13/00*; **B44C** *1/00*; **G01L** *1/22*

U.S. Cl. 156—215 **9 Claims**

1. In a method for installing in a tubular shaft, multiple electronic devices, such as strain gages, having bonding surfaces and leads extended therefrom, the steps comprising:

A. forming a flexible, template-like component from a thin sheet of Teflon, said template being provided with multiple openings for receiving said electronic devices and characterized by an etched bonding surface;

B. inserting electronic devices into the openings provided for said component with the bonding surfaces of the electronic devices being exposed at the etched surface of the template-like component, and the leads of the electronic devices being extended along the surface of the component opposite the etched surface thereof;

C. wrapping the component around an expansible cylinder with the etched surface of the template facing away from the cylinder thus to form an insertion assembly;

D. coating with adhesive the etched surface of the template and mounting surfaces of the electronic devices;

E. inserting the assembly to a desired depth within the tubular shaft; and

F. expanding the cylinder for forcing the surfaces of the template-like component and the surfaces of the electronic devices to which the adhesive has been applied into bonding contact with the adjacent surface of the shaft for thus bonding the component and electronic devices to the shaft.

9. A device particularly suited for use in installing strain gages internally of a tubular load bearing shaft, comprising:

A. an expansible cylinder formed of silicon rubber, said cylinder being characterized by an outside diameter less than the internal diameter of said shaft;

B. means for pneumatically sealing each of the opposite ends of said expansible cylinder including a pair of metallic plates adhesively secured to the cylinder and interconnected by a plurality of rigid tie-bolts, at least one of said plates being provided with a pneumatic valve for accommodating a pneumatic pressurization and depressurization of said cylinder;

C. a flexible template-like component for mounting strain gages on the external surface of said cylinder, said component formed of bondable Teflon and including a bonding surface engagable with the internal surface of said shaft and a plurality of openings defined in the template, strain gages secured in said openings in a manner such that a mounting surface for each strain gage protrudes through one of said openings formed in the component; and

D. means comprising an adhesive for uniting the bonding surface of the component and the mounting surface of

each strain gage to the internal surface of said shaft in response to a pressurization of the cylinder.

4,407,687

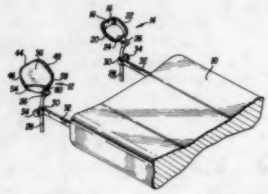
METHOD OF MANUFACTURING COVER FOR STIRRUP OF PHYSICIAN'S EXAMINATION TABLE

Winalee G. Mitchell, 110 Secor Woods La., Perrysburg, Ohio 43551

Division of Ser. No. 159,974, Jun. 16, 1980, Pat. No. 4,360,193. This application Jul. 21, 1982, Ser. No. 400,535

Int. Cl.³ B31F *23/10*

U.S. Cl. 156—227 2 Claims



1. A method of making a cover for a stirrup of a medical examination table, comprising the steps of:

advancing a first band of elastomeric sheet material and a substantially wider second band of elastomeric sheet material into a face-to-face relationship;

uniting said bands in a first bonding operation to form therebetween a pocket having an open mouth with an edge defined by an edge of said first band, said pocket being of a width and depth sufficient to accommodate at least the upper portion of a stirrup;

cutting the material of said second band to form a flap extending beyond said edge of said open mouth, said flap and said pocket having a longitudinal axis which extends from the bottom of said pocket past said open mouth and along said flap;

separating said flap and said pocket from said bands; folding at least a portion of said flap along said axis so that said edge of said open mouth is at the exterior surface of the folded article; and

forming a heel cushioning and protecting portion in said flap in a second bonding operation by uniting said folded portion in a curved seam extending upwardly from said axis.

4,407,688

METHOD OF MAKING HELICOPTER BLADE SPARS

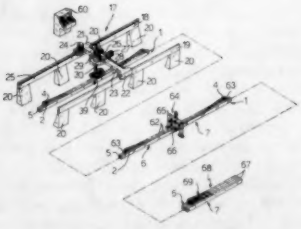
Fiorenzo Mussi, Milan, and Emilio Pariani, Cardano al Campo, both of Italy, assignors to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Italy

Filed Jan. 6, 1982, Ser. No. 337,443

Claims priority, application Italy, Feb. 5, 1981, 67152 A/81

Int. Cl.³ B29C *23/00*

U.S. Cl. 156—242 5 Claims



1. A method of making spars for helicopter blades, each said spar comprising two pairs of ribs (64) lying parallel to and alongside one another, in which each said rib (64) is constituted by a tape (2) folded into a substantially U-shape and comprising two substantially rectilinear twisted arms lying alongside one another and joined together by a curved section (63), the method being characterised by the fact that it utilises a double forming mould (1) which can permit the simultaneous forming of two of the said ribs (64) opposite one another and joined together at the free ends of the said arms, and includes steps consisting in the deposition of the said tape (2) onto the said forming mould (1) with a continuous circulating movement in such a way as to define an annular body constituted by the said two ribs (64) opposite one another and rigidly joined together, and in subsequently cutting the said annular body on the said mould (1) in such a way as to separate the said two ribs (64) from one another, separating the said mould (1) into two half moulds (6,7) at the line of cut separating the said two ribs (64), and in turning the said half moulds (6,7) with respect to one another to bring them alongside one another to define a further forming mould (68) for one of the said pair of ribs (64).

4,407,689

PROCESS FOR PRODUCTION OF LAMINATED MEMBER

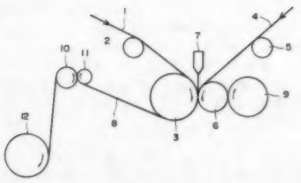
Akira Ohtsuki; Hirokichi Ishino; Hiromu Sakai; Susumu Tsuchiko; Kazuo Tawara, and Takahiko Yamasoba, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 218,134, Dec. 19, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,038

Claims priority, application Japan, Dec. 21, 1979, 54/165700; Mar. 10, 1980, 55/29159

Int. Cl.³ B29D *7/14*

U.S. Cl. 156—243 10 Claims



1. A process for producing a laminated member including a metal foil or a metal foil backed with a thermoplastic resin (1) and a thermoplastic resin film (4) said process comprising steps of:

heating the foil (1) and the film (4) with at least one adhesive disposed therebetween, said adhesive being selected from a carboxyl group-containing polyolefin and a polyolefin based resin prepared by heat-compounding a carboxyl group-containing polyolefin and a metal compound, at a temperature which is higher than the melting temperature of the adhesive and pressing to form a laminated member (8); and

cooling the laminated member (8) at the heat distortion temperature of the adhesive or at a temperature higher than the heat distortion temperature while applying a pressure of at least 1 kg/cm^2 using a cooling roll (10) and a resilient nip roll (11) such that said laminated member (8) is brought into contact first with the resilient nip roll (11).

4,407,690

PROCESS FOR COATING WEBS WITH POLYETHYLENE

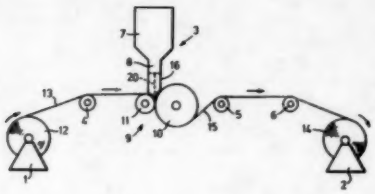
George White, Glenburnie, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Mar. 10, 1982, Ser. No. 356,718

Claims priority, application United Kingdom, Mar. 18, 1981, 8108486

Int. Cl.³ B29C *19/00;* **B05D** *3/12*

U.S. Cl. 156—244.27 **10 Claims**



1. A process for coating a substrate web with a polyethylene in which process the polyethylene, having a melt index of between about 30 dg/min and about 100 dg/min, is extruded through a slot in a slotted die in the form of a sheet having two edges onto the substrate web being transported past the slotted die, to form a coated web; and subsequently the coated web is passed through a nip roll assembly comprising a chill roll and a nip roll which form a throat therebetween, said slot at the extremities thereof having edge guides which are maintained at a temperature higher than the melting temperature of the polyethylene and are adapted to guide the two adhered edges of the extruded sheet into the throat of the nip roll assembly.

4,407,691

METHOD AND APPARATUS FOR PERFORMING HOT AIR WELDING OF THERMOPLASTIC RESIN PARTS

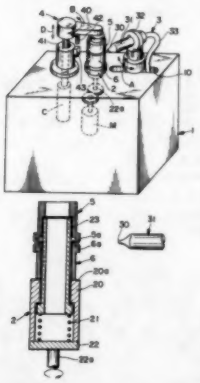
Masami Ishii, Toyota; Nobuharu Kato, Nagoya, and Mikio Hota, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 136,050, Mar. 31, 1980, Pat. No. 4,315,791. This application Sep. 3, 1981, Ser. No. 299,136

Claims priority, application Japan, Apr. 19, 1979, 54/48386

Int. Cl.³ B29C *25/00;* **C09J** *5/00*

U.S. Cl. 156—304.2 **3 Claims**



1. A process for welding a pair of thermoplastic resin parts along their peripheral surfaces comprising the steps of holding one of said parts on an end face of a rotatable cylinder and the other of said parts on an end face of an axially movable guide member having a portion projecting from the end face of the cylinder with the peripheral surfaces of the parts opposed to and spaced from each other, rotating said cylinder and guide member in the same direction and at the same speed, so that said parts are rotated at the same speed, positioning a nozzle means in an operative position and blowing hot air through said nozzle means toward the peripheral surfaces of said rotating parts while said peripheral surfaces are spaced from each other causing said peripheral surfaces to melt, forcing said parts toward each other to bring the melted peripheral surfaces into integral contact with each other causing the parts to be welded together, and displacing the nozzle means to an inoperative position and removing the welded parts from the cylinders.

4,407,692

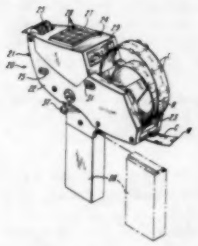
HAND-HELD ELECTRICALLY SELECTABLE LABELER

Daniel J. Torbeck, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 29, 1981, Ser. No. 268,590

Int. Cl.³ B41J *3/00;* **B41F** *1/08*

U.S. Cl. 156—350 **88 Claims**



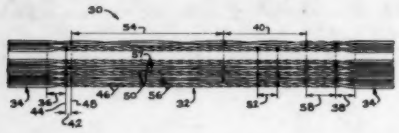
1. A hand held labelling machine comprising; a housing having a manually engageable handle, the housing having means for holding a label supply roll of a composite web having labels releaseably adhered to a backing strip the housing further having means for receiving a source of electrical energy, means for printing on a label at a printing position, means for peeling the printed label from the back strip, label applying means disposed adjacent the peeling means, means for advancing the web to peel a printed label from the backing strip at the peeling means and advance the printed label into label applying relationship with the label applying means and to advance another label into the printing position, means including a keyboard mounted on the housing for entering selected data to be printed, the printing means including a thermographic printing head having a plurality of individually selectable printing elements arranged in a single line array having a density of at least 200 elements per inch disposed substantially transverse to the direction of advancement of the web and powered by the source of electrical energy for printing on a thermographic label at the printing position, means coupled to the keyboard for receiving and electrically processing data representative of the selected data entered by the keyboard, means electrically coupling the data receiving and processing means and the thermographic printing head, and means for causing the data receiving and processing means to operate the thermographic printing head to print the selected data on the label.

4,407,693

APPARATUS FOR MAKING LOW CROSSTALK RIBBON CABLE

Patrick J. Paquin, Hamden, Conn., assignor to Allied Corporation, Toledo, Ohio

Filed Mar. 23, 1981, Ser. No. 246,798
The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.
Int. Cl.³ H01B 13/00
U.S. Cl. 156—436 19 Claims



1. Apparatus for making multiple conductor ribbon cable having a plurality of longitudinally extending insulated conductor pairs and having twisted conductor portions serially alternating with straight conductor portions, comprising:

first means for supplying a plurality of first conductor pairs and continuously twisting said first conductor pairs in a first direction;

second means for supplying a plurality of second conductor pairs and continuously twisting said second conductor pairs in a second direction;

first twister means for precisely intermittently starting and stopping to intermittently twist said first conductor pairs in said first direction to form a plurality of first twisted conductor portions having a twist length of a first predetermined distance and a plurality of first straight conductor portions having a predetermined length;

second twister means for precisely intermittently starting and stopping to intermittently twist said second conductor pairs in said second direction to form a plurality of second twisted conductor portions having a twist length of a second predetermined distance and a plurality of second straight conductor portions having said predetermined length;

means for maintaining said first conductor pairs and said second conductor pairs as said straight conductor portions for a predetermined distance after said stopping of said first twister means and of said second twister means;

means for applying a first sheet of plastic film to one first side of said insulated conductor pairs to adhere to both said first and said second twisted conductor portions and said first and second straight conductor portions upon subsequent bonding of said conductor portions and said first plastic film;

means for bonding said first plastic film to said first and second twisted conductor portions and to said first and second straight conductor portions;

said means for bonding including third means for precisely laterally aligning said first and second twisted conductor portions during the bonding thereof to said first plastic film and fourth means for precisely laterally aligning said first and second straight conductor portions during the bonding thereof to said first plastic film;

said third means including a first roller having a series of channels therein for precise lateral spacing of each said twisted conductor portion during bonding of said first and second twisted conductor portions;

said fourth means including a second roller having a series of channels therein for precise lateral spacing of each said straight conductor portion during bonding of said first and second straight conductor portions; and

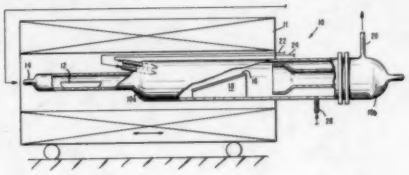
means for sequentially positioning said first roller and said second roller for bonding of said serially alternating twisted conductor portions and said straight conductor portions.

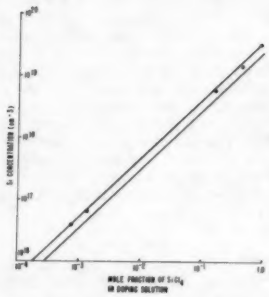
4,407,694

MULTI-RANGE DOPING OF EPITAXIAL III-V LAYERS FROM A SINGLE SOURCE

Victor K. Eu, Redondo Beach; Milton Feng, Rancho Palos Verdes; Timothy T. Zielinski, Hawthorne, and James M. Whelan, Glendale, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 22, 1981, Ser. No. 276,104
Int. Cl.³ H01L 21/205, 21/223
U.S. Cl. 156—606 13 Claims





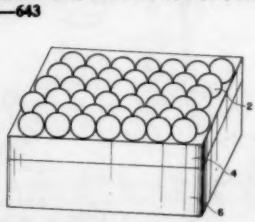
1. A process for providing a range of doping levels from a single doping source using vapor phase epitaxial growth of a III-V semiconductor layer under substantially equilibrium conditions using halide or hydride epitaxy growth process in which the doping source comprises a liquid solution of (a) a compound selected from the group consisting of arsenic halides and phosphorus halides and (b) a compound selected from the group consisting of silicon halides and germanium halides.

4,407,695

NATURAL LITHOGRAPHIC FABRICATION OF MICROSTRUCTURES OVER LARGE AREAS

Harry W. Deckman, Clinton, and John H. Dunsmuir, Madison, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 336,036, Dec. 3, 1981. This application Mar. 29, 1982, Ser. No. 363,019
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06; H01L 21/306
U.S. Cl. 156—643 27 Claims



1. A method producing a lithographic mask on the surface of

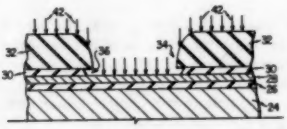
a substrate comprising coating said substrate with a monolayer of colloidal particles substantially over the entire surface such that said particles are fixed to said substrate in a predetermined way as to particle size distribution and mean distance between particles, said monolayer of colloidal particles serving as an etch mask for forming an etched pattern in said substrate.

4,407,696

FABRICATION OF ISOLATION OXIDATION FOR MOS CIRCUIT

Yu-Pin Han, Dallas, and Bing C. Ma, Carrollton, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 27, 1982, Ser. No. 453,214
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; H01L *21/306*
U.S. Cl. 156—653 **5 Claims**



1. A method for fabricating isolation oxidation on a silicon semiconductor substrate, comprising the steps of:
- producing a first oxide layer on the surface of said substrate,
- producing a polysilicon layer on the surface of said first oxide layer,
- producing a nitride layer on the surface of said polysilicon layer,
- etching said nitride layer to open an area therein,
- producing said isolation oxidation as a layer located in the region of the open area of said nitride layer, said isolation oxidation layer comprising said first oxide layer, oxide derived from said polysilicon layer and oxide derived from said semiconductor substrate, and
- etching said nitride layer, said polysilicon layer and said first oxide layer from at least the edges of said isolation oxidation layer.

4,407,697

PROCESS FOR MAKING ELECTRICAL INSULATING PAPER AND THE PRODUCT THEREOF

Fred S. Sadler, St. Jessup, Pa.; Paul F. Hettwer; Vu H. Viet, both of Franksville, Wis., and Clarance R. Acker, Zanesville, Ohio, assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Apr. 5, 1982, Ser. No. 365,523
Int. Cl.³ D21H *1/48*; H05K *5/00*
U.S. Cl. 162—137 **11 Claims**

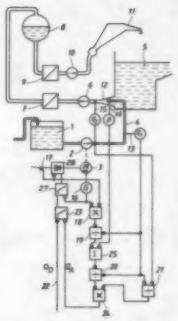
1. A method for improving the thermal stability and dielectric integrity of cellulosic material especially adaptable for use as electrical insulation comprising: (a) forming a continuous web of cellulosic material, (b) impregnating said web with a nitrogen-donor compound in an amount sufficient to provide said web with a nitrogen content of not less than 0.2% by weight, (c) drying said web to a moisture content not greater than 10% by weight, (d) thereafter impregnating said web with an aqueous solution of a vegetable protein having a pH of not less than about 8.5, and (e) drying said web.

4,407,698

APPARATUS FOR REGULATING FIBER CONCENTRATION

Nils E. Andersson; Sten Eriksson, and Bengt Sinner, all of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Mar. 30, 1981, Ser. No. 248,867
Claims priority, application Sweden, Apr. 3, 1980, 8002587
Int. Cl.³ D21C *1/06, 1/08*
U.S. Cl. 162—258 **2 Claims**



1. Apparatus for regulating the fiber concentration of a fiber suspension, when above about 2 per cent by weight fibers, during transport of said fiber suspension through a conduit to an outlet thereof, the fiber suspension being mixed with a liquid diluent, said apparatus comprising
- a variable speed-controlled electric motor,
- a regulating system for controlling the operation of said electric motor,
- a first pump driven by said electric motor for impelling said fiber suspension through the conduit toward said outlet,
- means for generating a signal representative of the power W supplied to said first pump by said electric motor,
- a second pump for mixing the fiber suspension issuing from said outlet with the liquid diluent,
- a flow meter providing an output signal q_1 proportional to the flow of said fiber suspension in said conduit,
- means for providing an output signal q_2 proportional to the flow of said fiber suspension and liquid diluent through said second pump,
- a first dividing means to which said signal representative of the power W and said output signal q_1 are fed, said first dividing means generating a first output signal which represents a measure of the fiber concentration Q,
- a summation means to which said first output signal is fed, said summation and dividing means adjusting the first signal based on the static pressure head loss which occurs in said conduit, thereby providing a second output signal which is proportional to the power consumed by said first pump in overcoming the dynamic resistance to flow of said fiber suspension in said conduit,
- a dividing means for obtaining a signal proportional to q_1/q_2, and
- a dividing and multiplying means to which said second output signal is fed, to which said output signal q_1 is fed and to which said signal proportional to q_1/q_2 is fed, said dividing and multiplying means generating a signal Q_A which is proportional to the actual fiber concentration in the fiber stock upstream and downstream of said second pump and which is fed to said regulating system.

4,407,699
PROCESS AND APPARATUS FOR THE DRY COOLING OF COKE

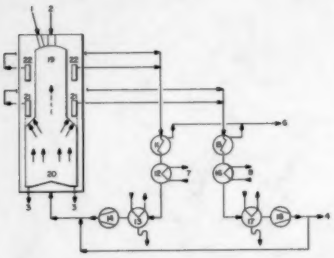
Claus Flockenhaus; Dietrich Wagener; Erich Hackler; Stefan Smieskol; Manfred Galow, all of Essen; Joachim Meckel, Heiligenhaus, and Dieter Breidenbach, Waltrop, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,742

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 304489

Int. Cl.³ C10B *27/00, 39/02*

U.S. Cl. 201—39 **18 Claims**



1. A process for the dry cooling of coke produced during a coking operation which also produces raw coke oven gas, said process comprising:

providing a vessel having therein first and second zones in full communication with each other;

introducing hot coke into said first zone, and passing said coke through said first and second zones without adding heat to said coke;

introducing raw coke oven gas from the coking operation into said first zone and therein reducing the temperature of said coke by means of said raw coke oven gas, while cleaning said raw coke oven gas to form cleaned coke oven gas;

removing said cleaned coke oven gas from said first zone;

removing heat from the thus removed cleaned coke oven gas;

utilizing the thus cooled cleaned coke oven gas as a heat carrier gas introduced into said second zone and therein further reducing the temperature of said coke by means of said heat carrier gas; and

removing the thus further cooled coke from said second zone.

4,407,700
INJECTOR FOR CALCINER

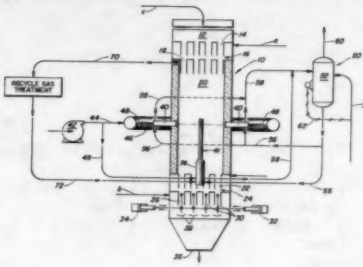
Richard L. Davis, Billings, Mont.; Harlan G. Graf, Ponca City, Okla.; Don L. Edwards, Ponca City, Okla., and William B. Macbeth, Jr., Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 14, 1982, Ser. No. 388,338

Int. Cl.³ C10B *1/04, 49/06*

U.S. Cl. 202—85 **8 Claims**

1. In an internally fired, vertical shaft kiln for the calcining of petroleum coke comprising a vertical shaft kiln having a top and bottom and an outer wall and an inner refractory wall, means for providing green particulate petroleum coke to a calcining chamber within the shaft kiln defined by upper and lower chamber walls and said inner refractory wall, means for removing calcined coke from said calcining chamber at the bottom of said shaft kiln and means for introducing recycle gas to the interior of the shaft kiln near the bottom thereof and means for introducing combustion gas to the interior of said shaft kiln comprising a plurality of radially disposed combustion gas injectors located at an intermediate level within said shaft kiln and defining a combustion zone therewithin, the improvement which comprises at least one vertical tubular combustion gas injector for injecting a combustion gas into said combustion zone, said vertical injector having a longitudinal central orifice and extending vertically within said calcining chamber and terminating in said combustion zone, said vertical injector having an annular coolant circulation space disposed therearound, coolant within said circulation space and means for providing said coolant to said annular space.



4,407,701
APPARATUS FOR TREATING GASES PRODUCED FROM COAL

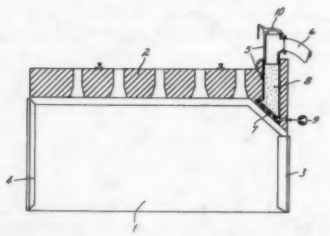
Dietrich Wagener; Horst Fach; Peter Sauder, all of Essen, and Otto Abel, Clausthal-Zellerfeld, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 205,931, Nov. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 169,672, Jul. 17, 1980, abandoned, which is a division of Ser. No. 69,866, Aug. 27, 1979, abandoned. This application Aug. 2, 1982, Ser. No. 404,534

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837416

Int. Cl.³ C10B *27/00*

U.S. Cl. 202—99 **2 Claims**



1. Coal conversion apparatus for the production of coke and the treatment of gases produced by the conversion of coal to coke in said apparatus to reduce the level of undesirable constituents in said gases comprising a coke oven for receiving coal for conversion to coke and gases, said coke oven having a roof, a vertically ascending standpipe mounted in said roof containing a coke bed at a temperature of at least about 1100° K., grate means at the bottom of said standpipe for supporting said coke bed from below in said standpipe while permitting said gases to pass upwardly through said standpipe without substantial condensation of said gases such that said gases pass through said coke bed in said standpipe to be treated thereby, and duct means communicating with said standpipe at its lower end for introducing a controlled amount of air into said coke bed in said standpipe.

4,407,702

APPARATUS TO EXTRACT GASES EVOLVING DURING CHARGING OF A COKE OVEN

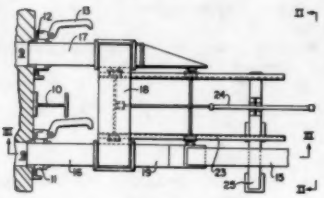
Hans-Jurgen Kwasnik, Herne, and Hans-Gunter Piduch, Bochum, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,456

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150657

Int. Cl.³ C10B *31/04, 41/00, 45/00*

U.S. Cl. 202—263 8 Claims



1. In a battery of horizontal coke oven chambers, the combination of removable oven doors at the ends of the coke oven chambers along one side of the oven battery, said oven doors each having an opening for a leveler for leveling a coal charge in the oven chamber thereof, gas-conducting means hermetically interconnecting said opening in an oven door of two adjacent oven chambers, truck means including a drive for moving said gas-conducting means in a direction longitudinally of an oven chamber between an operative position forming a hermetic seal with oven chambers and an inoperative position, and a leveler adapted to extend in said gas-conducting means for operation in an oven chamber.

4,407,703

AMINE SEPARATION PROCESS

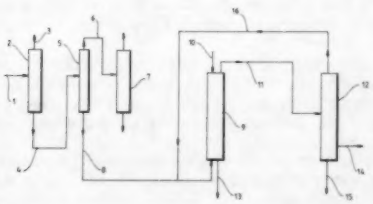
William Featherstone, Nunthorpe, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 227,344, Jan. 22, 1981, abandoned. This application Feb. 18, 1982, Ser. No. 349,816

Claims priority, application United Kingdom, Feb. 8, 1980, 804303

Int. Cl.³ B01D *3/14, 11/04*

U.S. Cl. 203—43 3 Claims



1. A process of separating a mixture comprising ammonia, mono-, di-, and tri-ethylamines, ethanol and water which comprises distilling the mixture in one or more stages to separate from said mixture substantially all the ammonia and monoethylamine and at least some of the ethanol and di-ethylamine, and subjecting the remainder of the thus distilled mixture comprising diethylamine, triethylamine, water and ethanol to a multi-stage liquid-liquid extraction using water as the sole extractant, said multi-stage extraction being carried out at a temperature in the range 75° to 95° C. and at a pressure greater than atmospheric pressure, recovering from said multi-stage extraction an aqueous extract rich in triethylamine and containing small amounts of diethylamine, water and ethanol and distilling said extract to recover pure triethylamine as the distillate, the process being characterized by reduced energy consumption and by increased recovery of triethylamine using less water extractant than when a single stage extraction is employed.

4,407,704

OXYGEN CONCENTRATION DETECTOR AND A METHOD OF DETECTING OXYGEN CONCENTRATION

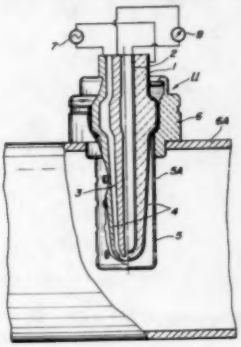
Syunzo Mase, Tobishima, and Shigeo Soejima, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Nov. 25, 1980, Ser. No. 210,239

Claims priority, application Japan, Dec. 4, 1979, 54-156314; Mar. 28, 1980, 55-39004

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—1 T 13 Claims



1. A method of detecting oxygen concentration in a gaseous environment using an oxygen concentration cell comprising the steps of:

preparing an oxygen ion conductive solid electrolyte body;

providing at least two separate electrodes contacting the oxygen ion conductive solid electrolyte body so as to form an oxygen concentration cell, at least one of said electrodes being exposed to a gaseous environment for detecting its oxygen concentration, and at least another one of said electrodes being exposed to a reference gaseous environment;

heating the solid electrolyte body by applying an AC voltage through at least two electrodes of said electrodes, and thereby decreasing the impedance of said cell, wherein said AC voltage is applied at a frequency which is sufficiently high that the impedance between said electrodes to which AC voltage is applied is largely independent of the interface capacitances between said electrodes to which AC voltage is applied and the surface of said solid electrolyte body; and

measuring the electromotive force of said cell when said solid electrolyte body is in its heated condition, said electromotive force representing, and thereby detecting the oxygen concentration in said gas.

6. An oxygen concentration detector for detecting the oxygen concentration in gases, comprising:

an oxygen ion conductive solid electrolyte body;

at least two separate electrodes contacting the solid electrolyte body so as to form an oxygen concentration cell;

AC power supplying means connected to at least two of said electrodes for heating said solid electrolyte body by applying an AC voltage, and thereby decreasing the impedance of said cell, wherein said AC power supplying means is arranged to supply an AC voltage at a frequency sufficiently high that the impedance between said elec-

trodes to which AC voltage is applied is largely independent of the interface capacitances between said electrodes to which AC voltage is applied and the surface of said solid electrolyte body; and

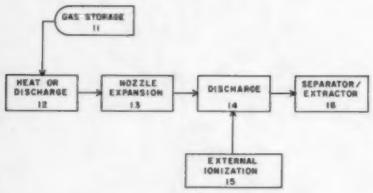
DC voltage detecting means connected to said electrodes constituting said oxygen concentration cell for measuring electromotive force of said cell when said solid electrolyte body is in its heated condition, said electromotive force representing and thereby detecting the oxygen concentration in gases.

4,407,705

PRODUCTION OF NEGATIVE IONS OF HYDROGEN

Alan Garscadden, Yellow Springs; William F. Bailey, and Gary L. Duke, both of Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 14, 1981, Ser. No. 263,629
Int. Cl.³ B01J *19/08, 19/12, 19/26*
U.S. Cl. 204—157.1 H **14 Claims**



1. A process for producing negatively charged ions of hydrogen which comrises:

a. cooling hydrogen gas to below 300° K.;

b. vibrationally exciting the molecules of the said hydrogen gas to a first vibrational energy state higher than the ground vibrational state;

c. anharmonically pumping said gas to a second vibrationally excited state higher than said first state; and

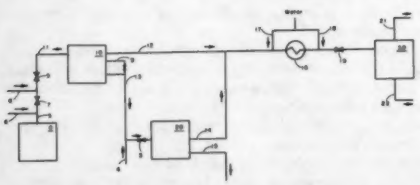
d. impacting the cooled and vibrationally excited hydrogen gas molecules with energetic electrons to produce, by dissociative attachment, neutral hydrogen atoms and negatively charged hydrogen ions.

4,407,706

PROCESS FOR DEDUSTING SOLIDS-CONTAINING HYDROCARBON OILS

Philip Merchant, Jr., Houston, Tex., and Dean L. Smith, Jr., Mountainside, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

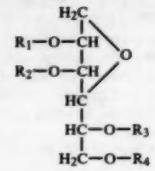
Filed Aug. 24, 1981, Ser. No. 295,797
Int. Cl.³ B01D *17/06*
U.S. Cl. 204—190 **41 Claims**



20. A process for dedusting shale oil which contains a low to moderate amount of finely divided solids which comprises

dispersing from about 10 parts to about 5000 parts, per million parts by volume of oil of an admixture of surfactant and demulsifier within said oil, the surfactant being

(I) an ester characterized as follows:



where R_1, R_2, R_3, and R_4 are selected from

(a) ethoxy or propoxy groups, or mixed ethoxy and propoxy groups, and

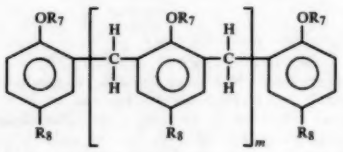
(b) the dehydroxylated residue of a fatty acid molecule, or moiety represented by the formula

where R is a straight-chain hydrocarbon moiety which can be substituted or unsubstituted, saturated or unsaturated, and where unsaturated can contain conjugated or unconjugated double bonds, and

at least one and up to three of R_1, R_2, R_3, and R_4 is ethoxy, propoxy, or mixed ethoxy and propoxy groups,

the demulsifier being

(II) an ethoxylated or propoxylated, or admixed ethoxylated/propoxylated, phenol formaldehyde resin substituted at a position para to the ethoxy or propoxy group, or mixed ethoxy/propoxy groups, by a hydrocarbyl group, said modified phenol formaldehyde resin being characterized as follows:



wherein

R_7 represents one or more ethoxy or propoxy groups, or mixed ethoxy and propoxy groups,

R_8 is a hydrocarbyl radical selected from the group consisting of alkyl, aralkyl, cycloalkyl, aryl, alkaryl, alkenyl, and alkynyl, and

m is an integer of one or greater, the molecular weight of said resin ranging from about 2000 to about 20,000;

the ratio of demulsifier:surfactant ranging from about 1:1 to about 15:1, based on the sum total volume of the demulsifier and surfactant,

admixing washwater in concentration ranging from about 5 percent to about 50 percent, based on the volume of oil, with said surfactant/demulsifier-containing shale oil, and emulsifying same to form a shale oil and water emulsion,

heating said shale oil and water emulsion to a temperature ranging from about 100° F. to about 350° F. by passage through a heat exchanger,

passing said heat shale oil/water emulsion to an electrostatic coalescer, maintaining a temperature within the electrostatic coalescer ranging from about 100° F. to about 350° F. and a residence time ranging from about 10 minutes to about 80 minutes, to separate said shale oil/water emulsion into a clean shale oil overflow and solids-containing water phase underflow, and

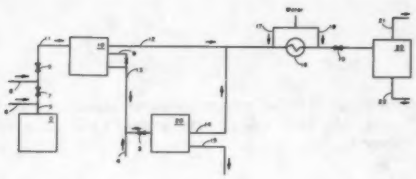
recovering a clean shale oil suitable as a feed for use in refining operations.

4,407,707

PROCESS FOR DEDUSTING SOLIDS-CONTAINING HYDROCARBON OILS

Philip Merchant, Jr., Houston, Tex., and Dean L. Smith, Jr., Mountainside, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

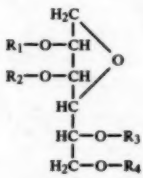
Filed Aug. 24, 1981, Ser. No. 295,799
Int. Cl.³ B01D 17/06
U.S. Cl. 204—190 40 Claims



1. A process for dedusting oils characterized as unconventional whole heavy crudes, heavy petroleum crude fractions and residua, syncrudes, syncrude fractions, and syncrude residua, which contain finely divided solids, which comprises

dispersing from about 10 parts to about 5000 parts, per million parts of oil by volume, of an admixture of surfactant and demulsifier within said oil, the surfactant being

(I) an ester characterized as follows:



where R_1, R_2, R_3, and R_4 are selected from

(a) ethoxy or propoxy groups, or mixed ethoxy and propoxy groups, and

(b) the dehydroxylated residue of a fatty acid molecule, or moiety represented by the formula

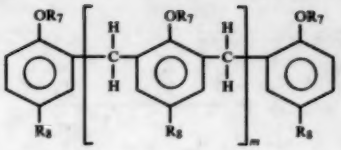
where

R is a straight-chain hydrocarbon moiety which can be substituted or unsubstituted, saturated or unsaturated, and where unsaturated can contain conjugated or unconjugated double bonds, and

at least one and up to three of R_1, R_2, R_3, and R_4 is ethoxy, propoxy, or mixed ethoxy and propoxy groups,

the demulsifier being

(II) an ethoxylated or propoxylated, or admixed ethoxylated/propoxylated, phenol formaldehyde resin substituted at a position para to the ethoxy or propoxy group, or mixed ethoxy/propoxy groups, by a hydrocarbyl group, said modified phenol formaldehyde resin being characterized as follows:



wherein

R_7 represents one or more ethoxy or propoxy groups, or mixed ethoxy and propoxy groups,

R_8 is a hydrocarbyl radical selected from the group consisting of alkyl, aralkyl, cycloalkyl, aryl, alkaryl, alkenyl, and alkynyl, and

m is an integer of one or greater, the molecular weight of said resin ranging from about 2000 to about 20,000;

the ratio of demulsifier:surfactant ranging from about 1:1 to about 15:1, based on the sum total volume of the demulsifier and surfactant,

admixing in a first stage washwater in concentration ranging from about 5 percent to about 50 percent, based on the volume of oil, with said surfactant/demulsifier-containing oil, and emulsifying same to form an oil and water emulsion,

separating said oil and water emulsion into an oil phase and solids-containing water phase,

recovering from said first stage an oil phase of reduced solids,

admixing with said surfactant/demulsifier-containing oil in a second stage additional washwater in concentration ranging from about 5 percent to about 50 percent, based on the volume of oil,

passing said admixture of surfactant/demulsifier-containing oil and water through a heat exchanger and heating said admixture to a temperature ranging from about 100° F. to about 350° F.,

emulsifying said heated admixture of surfactant/demulsifier-containing oil and water,

passing said emulsion into an electrostatic coalescer, maintaining said emulsion at a temperature ranging from about 100° F. to about 350° F. for a period ranging from about 10 minutes to about 80 minutes, while

separating said oil and water emulsion into an oil phase overflow, and solids containing water phase underflow, and

recovering from said second stage an oil phase of reduced solids suitable as a feed for use in refining operations.

4,407,708

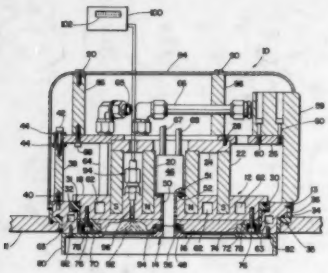
METHOD FOR OPERATING A MAGNETRON SPUTTERING APPARATUS

Richard F. Landau, Morgan Hill, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 6, 1981, Ser. No. 290,457
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 2 Claims

1. A method for operating a magnetron sputtering apparatus of the type which includes a sputtering target having a flat surface in contact with a flat surface of a cathode of said appa-

ratus, including monitoring the temperature of said cathode at a point adjacent said flat surface of said cathode, and ceasing



operation of said apparatus and replacing said sputtering target when said temperature reaches a predetermined value.

4,407,709

METHOD AND APPARATUS FOR FORMING OXIDE COATING BY REACTIVE SPUTTERING TECHNIQUE

Katsuhisa Enjouji; Hiroshi Ikeizumi, both of Nishinomiya; Kenji Murata, Takarazuka, and Syozaburo Nishikawa, Itami, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Mar. 31, 1982, Ser. No. 363,777

Claims priority, application Japan, Mar. 31, 1981, 56/48258

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 SP **15 Claims**

1. In a method for forming a coating of an oxide on a support by the reactive sputtering technique, the improvement which comprises measuring the optical intensities of three spectral components having a given wavelength of the spectrum of a plasma formed between the support and a target composed of an oxidizable substance convertible to said oxide, said three spectral components being derived from an inert gas, oxygen gas and said oxidizable substance, comparing the measured intensities of the three spectral components with the standard intensities of three spectral components of the same wavelength respectively, and continuously or intermittently varying the physical amount of a sputtering gas and the amount of an electric current from a sputtering power supply so that the measured intensities of the former spectral component approach the standard intensities of the latter spectral components.

4,407,710

HYBRID METHOD OF MAKING AN AMORPHOUS SILICON P-I-N SEMICONDUCTOR DEVICE

Theodore D. Moustakas, Berkeley Heights, N.J.; Don L. Morel, Woodland Hills, Calif., and Benjamin Abeles, Princeton, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 15, 1981, Ser. No. 311,546

Int. Cl.³ C23C *15/00;* **H01L** *31/18*

U.S. Cl. 204—192 S **19 Claims**

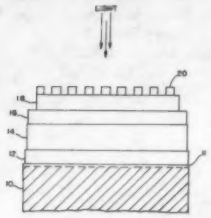
1. A method for producing a hydrogenated amorphous silicon PIN photovoltaic device exhibiting increased blue photoresponse, said method comprising the steps of:

providing a substrate having at least a region of a first electroconductive material which forms an ohmic contact to n-doped amorphous silicon;

depositing a layer of n-doped hydrogenated amorphous silicon onto said ohmic contact;

depositing a layer of undoped, intrinsic hydrogenated amorphous silicon onto said n-doped layer by means of glow discharge decomposition of silane;

reactively sputter depositing a layer of p-doped hydrogenated amorphous silicon onto said intrinsic layer, said p-doped layer forming a semiconductor junction with said intrinsic layer and having an optical gap greater than 1.8 ev;



depositing a layer of a second electroconductive material onto said p-layer, said material forming an ohmic contact thereto.

4,407,711

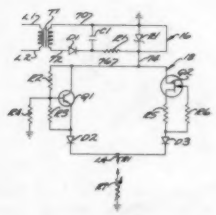
CORROSION PROTECTION SYSTEM FOR HOT WATER TANKS

Robert Baboian, Johnston, R.I., and Gardner Haynes, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 90,776, Nov. 2, 1979. This application Jun. 5, 1981, Ser. No. 270,945

Int. Cl.³ C23F *13/00*

U.S. Cl. 204—196 **2 Claims**



1. An impressed current protection system for a hot water tank in which the tank is constructed at least in part of corrosively active material and in which an anode of electrochemically active noble metal is disposed in the tank, a power supply for the system comprising transformer means to supply a relatively low, constant voltage source, the output of the transformer means connected to the anode through two parallel circuit branches, means to provide a first level of anode current at values of water resistivity above a first selected amount and a second level of anode current at values of water resistivity below a second selected amount and to provide intermediate the first and second selected amounts a level of anode current which is inversely proportional with the value of resistivity of the water comprising

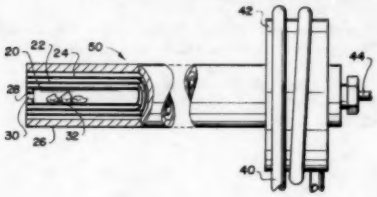
a constant voltage branch having an NPN transistor whose collector is connected to the constant voltage source of the transformer means and whose emitter is connected to the anode, and

a constant current branch which is adapted to conduct the second level of current at levels of water resistivity below the second selected amount.

4,407,712
HOLLOW CATHODE DISCHARGE SOURCE OF METAL VAPOR

William F. Henshaw, Street; John R. White, Darlington, and Andrus Niiler, Bel Air, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,882
Int. Cl.³ C23C *13/12, 15/00*
U.S. Cl. 204—298 **8 Claims**



1. A device for ion plating a substrate with high temperature metal vapor comprising:

an evacuable chamber enclosing;

a hollow cathode tube having an end opening and adapted to receive a high temperature plating metal at a selected distance from said opening;

gas supply means connected to said cathode tube for supplying a gas therethrough at a selected flow rate;

an anode spaced from said cathode tube open end; and

power supply means connected to said cathode tube and anode to bias said cathode tube negatively with respect to said anode sufficiently to produce an arc therebetween and evaporate the high temperature metal in said cathode tube;

means for mounting a hollow substrate surrounding said cathode and anode; and power supply means for negatively biassing said substrate;

wherein said selected distance is chosen to correspond substantially to a location of maximum temperature which is a characteristic of the inside diameter of said cathode tube and the gas flow rate supplied by said gas supply means.

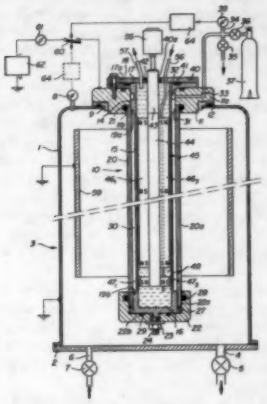
4,407,713
CYLINDRICAL MAGNETRON SPUTTERING CATHODE AND APPARATUS

Bogdan Zega, Geneva, Switzerland, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Aug. 6, 1981, Ser. No. 290,426
Claims priority, application European Pat. Off., Aug. 8, 1980, 80200753.4
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—298 **11 Claims**

1. An improved cylindrical magnetron cathodic sputtering apparatus for coating a substrate with a material from a tubular target within an evacuated sealed enclosure, in which magnetic fields enhance the sputtering of the tubular target, said target having a sputtering face of the material to be sputtered and a back face opposed to the sputtering face, wherein the improvement comprises:

a magnet assembly that is radially magnetized, disposed behind the back face of the tubular target, having a plurality of equiangularly spaced, axially extending magnets and designed to generate a magnetic flux of straight arch portions connected to arcuate end portions which combine to project at least one intense, closed-loop plasma over the sputtering face of the tubular target.



4,407,714
PROCESS FOR CRACKING HIGH-BOILING HYDROCARBONS USING HIGH PORE VOLUME, LOW DENSITY CATALYST

George D. Myers, deceased, late of Ashland, Ky. by Virginia K. Myers, administrator; William P. Hettinger, Jr., Russell, and Stephen M. Kovach, Ashland, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed May 13, 1981, Ser. No. 263,391
Int. Cl.³ C10G *11/18*
U.S. Cl. 208—120 **67 Claims**

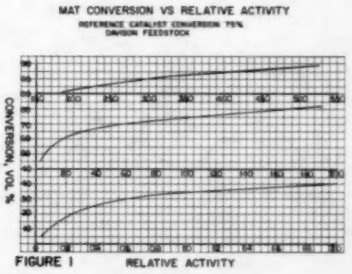


FIGURE 1

1. A process for converting carbo-metallic oils to lighter products comprising:

(a) providing a converter feed containing 650° F.+ material, at least a portion of said 650° F.+ material containing components which will not boil below about 1025° F., said 650° F.+ material further being characterized by a carbon residue on pyrolysis of at least about one and by containing at least about 4 ppm of Nickel equivalents of heavy metals;

(b) providing a cracking catalyst having an average pore volume of at least about 0.2 cc per gram;

(c) bringing said cracking catalyst into contact with said feed to form a stream comprising a suspension of said catalyst in said feed, at least a portion of said feed remaining unvaporized and depositing as a liquid on said catalyst parti-

cles, and causing the resulting stream to flow through a progressive flow reactor having an elongated reaction chamber which is at least in part vertical or inclined for a predetermined vapor residence time in the range of about 0.5 to about 10 seconds, at a temperature of about 900° F. to about 1400° F. and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50% to about 90% while producing coke in amounts in the range of about 6 to about 14% by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3% by weight, the ratio by weight of catalyst to oil being sufficiently high so that the total pore volume of the catalyst is greater than the volume of feed which will not boil below about 1025° F.;

(d) separating said catalyst from the resulting cracking products;

(e) stripping adsorbed hydrocarbons from said separated catalyst;

(f) regenerating said catalyst with oxygen-containing combustion-supporting gas under conditions of time, temperature and atmosphere sufficient to reduce the carbon on the catalyst to about 0.25% by weight or less, while forming a gaseous combustion product comprising CO and/or CO_2; and

(g) recycling the regenerated catalyst to the reactor for contact with fresh converter feed.

4,407,715

METHOD OF AND APPARATUS FOR THE FLOTATION PROCESSING OF MINERALS

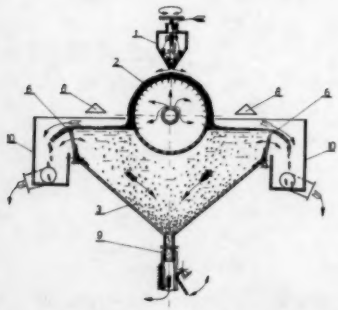
Alexey D. Sheludko; Rumen V. Ivanov; Dobrin V. Nikolov, and Ivan M. Nishkov, all of Sofia, Bulgaria, assignors to Institute Po Physikochimia pri Ban, Sofia, Bulgaria

Continuation-in-part of Ser. No. 816,817, Jul. 18, 1977, abandoned, Ser. No. 961,100, Nov. 16, 1978, abandoned, and Ser. No. 87,977, Oct. 25, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 316,077

Claims priority, application Bulgaria, Jul. 16, 1976, 33774

Int. Cl.³ B03D *1/02, 1/14*

U.S. Cl. 209—164 **16 Claims**



1. A method of flotation-processing minerals in particulate form, comprising pretreating of the starting mineral material by means of flotation agents to form a pulp suspension, fixedly positioning a drum with its longitudinal axis horizontal, with its lower portion immersed in a bath of said pulp suspension, and with its upper portion exposed above the upper surface of said bath, the drum having a perforated peripheral surface the apertures in which are controllable as to size, spreading the pretreated starting material in the form of a thin pulp suspension film over the exposed upper surface of the drum, blowing a compressed air stream upwardly through the pulp suspension film on the exposed upper surface of the drum from the inner to the outer surface of the drum whereby to form a forth thereon, discharging the froth and the mineral granules adhering thereto from the froth on the exposed upper surface of the bath, and discharging the material in the pulp suspension including unadhered mineral particles submerged in the bath from a lower portion of the bath.

4,407,716

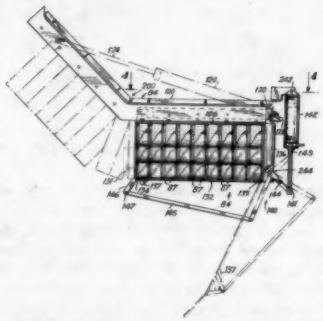
LIQUID FLOW SYSTEM INCLUDING MULTI-AXIAL LIQUID FLOW SCREENING MEANS FOR EXCLUDING OVERSIZED SLENDER OBJECTS CARRIED BY A LIQUID

John P. Latimer, and Glenn E. Miller, both of Newport News, Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Jun. 8, 1981, Ser. No. 271,551

Int. Cl.³ B01D *35/02, 35/28;* E02F *3/94*

U.S. Cl. 210—155 **11 Claims**



1. In a liquid flow system conprising a liquid flow conduit, liquid pumping means for drawing a flow of liquid through the flow conduit, the conduit being in fluid flow connection with the inlet to the pump, and screening means located in fluid flow connection within the conduit for preventing the passage of long slender objects with any liquid flowing through the conduit and to the pump inlet, the screening means comprising:

(a) a conduit for liquid flow; and

(b) a plurality of pairs of separated, opposed complementarily aligned, undulating surfaces mounted within the conduit and defining restricted, curved separate channels for the flow of liquid, the undulating surfaces being arranged such that the axes of curvature of the undulating surfaces extend in at least two transverse directions, such that a long slender object of predetermined dimensions aligned in any direction cannot pass through any of the separate channels.

4,407,717

WASTEWATER TREATMENT PROCESS

Gerald H. Teletzke, and Allen H. Erickson, both of Wausau, Wis., assignors to Sterling Drug Inc., New York, N.Y.

Continuation of Ser. No. 214,450, Dec. 8, 1980, abandoned. This application Nov. 24, 1982, Ser. No. 444,350

Int. Cl.³ C02F *3/04*

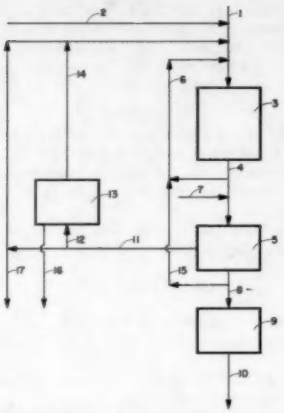
U.S. Cl. 210—616 **29 Claims**

1. A process for treating wastewaters, comprising the steps of:

(a) forming a mixture of influent wastewater and a powdered adsorbent capable of adsorbing impurities from said wastewaters;

(b) passing said mixture downward through a fixed media filter through which air passes by natural or forced ventilation and having microorganisms attached to the media,

wherein wastewater, adsorbent, microorganisms and air are contacted; and



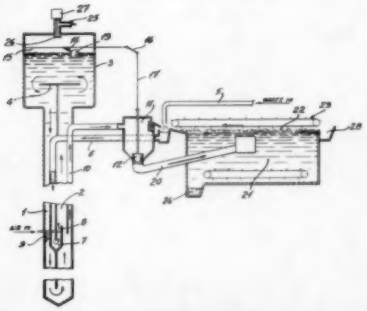
(c) separating adsorbent from said mixture after passage through the fixed media filter to produce a treated and clarified wastewater.

4,407,718

LONG VERTICAL SHAFT BIOREACTOR WITH PRESSURIZED HEAD TANKS

David C. I. Pollock, Richmond Hill, Canada, assignor to C-I-L Inc., North York, Canada

Continuation of Ser. No. 159,350, Jun. 13, 1980, abandoned. This application Nov. 5, 1981, Ser. No. 318,390
Claims priority, application Canada, Oct. 26, 1979, 338535
Int. Cl.³ C02F 3/12
U.S. Cl. 210—626 **5 Claims**



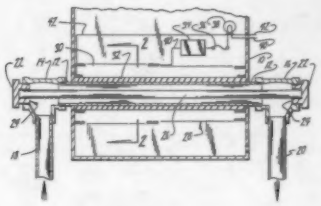
1. An improved activated sludge waste treatment process wherein an aerobic biological reaction takes place during the continuous circulation of a waste liquor in an apparatus including a surface basin, a long vertical downcomer chamber, a long vertical riser chamber operatively communicating with the downcomer through the basin and at the lower end of the downcomer to form a loop, and including means to introduce influent waste liquor at depth into said riser and to discharge effluent waste liquor at depth from said riser at a location lower in the said riser than the point of influent introduction and including means to circulate waste liquor through the said riser and downcomer in the presence of oxygen-containing gas, the improvement comprising surrounding said surface basin in a gas tight enclosure, maintaining a substantially constant level of waste liquor in said basin while maintaining the surface of waste liquor in said basin under supra-atmospheric pressure to control the degree of gas disengagement from the waste liquor in the said basin.

4,407,719

MAGNETIC WATER TREATMENT APPARATUS AND METHOD OF TREATING WATER

Donald J. Van Gorp, Rte. #2, Pella, Iowa 50219

Filed Oct. 30, 1981, Ser. No. 316,725
Int. Cl.³ C02F 1/48
U.S. Cl. 210—695 **5 Claims**



1. A water treatment apparatus comprising,

elongated pipe means having an inlet and an outlet opening at the opposite ends thereof for the passage of water therethrough,

means for establishing an alternating electro-magnetic force field within said pipe means, said means for establishing the electro-magnetic force field comprising an electrical coil, a thermostat connected to said coil, with said thermostat being connected to a source of alternating current,

rod means comprised of ferromagnetic material supported within said pipe means whereby water passing through said pipe means surrounds said rod means,

insulating means for magnetically insulating said means for establishing an alternating electro-magnetic force field from said pipe means, and

insulating means for magnetically insulating said rod from said pipe,

said inlet and outlet being completely separated so that water passing through said pipe means will not re-enter said pipe means.

4,407,720

METHOD AND APPARATUS FOR FILTRATION OF CONTAMINATED LIQUIDS

Jack R. Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48033

Filed Apr. 8, 1982, Ser. No. 366,817
Int. Cl.³ B01D 37/02, 33/06
U.S. Cl. 210—777 **4 Claims**

1. In a filtration system for separating solid particles from a liquid of the type characterized by a rotatable drum having a perforate cylindrical surface fully submerged in the contaminated liquid and provided with suction means connected to the interior of the drum to establish flow of contaminated liquid through the perforate surface and into the drum interior, the improved method of filtration which comprises:

sub-dividing the interior of the drum into a plurality of radially shallow parallel adjacent peripheral chambers, each chamber defined on its radially outward boundary by a circumferentially narrow portion of the perforate drum periphery extending a substantial portion of the length of the drum, each of said chambers being otherwise sealed except for an outlet into a main filtered liquid chamber within the interior of the drum;

establishing an inward flow of liquid through the perforate surface of the drum and into said peripheral chambers and

then into said main filtered liquid chamber and then to an outlet from the drum;

establishing a flow of pressurized filter liquid to backwashing liquid port means at a stationary location within the interior of the drum where, at any angular position of the drum, only a small fraction of the total number of peripheral chambers communicate with said port means to receive said pressurized backwashing liquid therefrom for causing accumulated filter cake to be removed from the perforate surface of the communicating chambers by the reverse flow of backwashing liquid therethrough;

and rotating said drum to selectively bring successive peripheral chambers into communication with said backwashing liquid port means;

whereby filtration proceeds through all of the chambers which are in communication with said main filtered liquid chamber simultaneously with backwashing through those chambers which are in communication with said backwashing liquid port means.

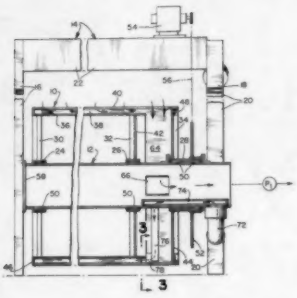


Fig. 3

2. The method of claim 1 which further includes the step of applying a filter air pre-coat at a location on the drum adjacent to the backwashing liquid port means, whereby the pre-coat may be applied to a portion of the drum which has been cleaned by the backwashing step and prior to the build-up of any significant amount of filter cake thereon.

4,407,721

PROCESS FOR MANUFACTURING POWDER FOR MAGNETIC RECORDING MEDIUM

Yoshiyasu Koike, Chigasaki; Osamu Kubo; Tadashi Ido, both of Yokohama, and Masanobu Uwaha, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 22, 1981, Ser. No. 304,683

Claims priority, application Japan, Sep. 22, 1980, 55-132130

Int. Cl.³ C04B *35/26;* C01G *49/00*

U.S. Cl. 252—62.59 **11 Claims**

1. A process for manufacturing a hexagonal ferrite magnetic powder for a magnetic recording medium comprising the steps of:

uniformly mixing and melting hexagonal ferrite-forming components and a glass-forming component as a base material for precipitated fine grains of the hexagonal ferrite;

rapidly cooling the resultant molten material to provide glass flakes;

thermally treating the glass flakes to precipitate the fine grains of the hexagonal ferrite therein;

incompletely dissolving the glass flakes containing the precipitated fine grains to a degree that glass remains present around the fine grains, said dissolution being achieved with boiling water or an acid which is capable of dissolving glass;

mechanically pulverizing the precipitated fine grains and the incompletely dissolved glass flakes in the presence of a dispersing agent capable of preventing flocculation of fine grains of ferrite and

separating and recovering the precipitated fine grains from the incompletely dissolved glass flakes, said grains being within the range of 0.01 to 0.3 microns and when incorporated into a recording film of a magnetic recording tape effecting a magnetic recording medium having a surface coarseness of not more than 0.1 microns.

4,407,722

FABRIC WASHING PROCESS AND DETERGENT COMPOSITION FOR USE THEREIN

James F. Davies, Wirral, and John B. Tune, Higher Bebington, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,308

Claims priority, application United Kingdom, Jun. 18, 1981, 8118802

Int. Cl.³ C11D *17/00, 7/06*

U.S. Cl. 252—91 **1 Claim**

1. A detergent composition suitable for washing fabrics in water containing calcium hardness, the composition comprising:

(i) about 2.5% to about 30% of at least one synthetic detergent active material;

(ii) at least about 10% of an alkalimetal carbonate as a primary detergency builder material; and

(iii) a secondary detergent builder material;

characterised by means for delaying the reaction between said secondary builder and the calcium hardness of the water until the critical state is reached, and secondary builder material being nitrilotriacetic acid coated with a fatty acid.

4,407,723

ABSORPTION OF CARBON DIOXIDE

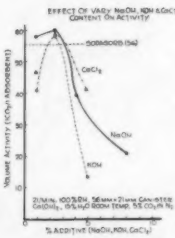
Clive D. R. MacGregor, Tantallon, and William G. Forsyth, Halifax, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Mar. 8, 1982, Ser. No. 356,035

Claims priority, application Canada, May 27, 1981, 378468

Int. Cl.³ C09K *3/00*

U.S. Cl. 252—192 **10 Claims**



1. In a method for making a carbon dioxide absorbent material, said absorbent material comprising about 75 to about 85%/w of a compound selected from the group consisting of group IA and IIA metal hydroxides, about 15 to about 20%/w of water and about 3 to about 5%/w of an additive,

the improvement comprising (1) providing said additive in solution in water wherein said additive solution comprises about 15 to about 20%/w of water, about 2 to about 3% of NaOH, about 1 to about 2%/w of KOH and about 0.1 to about 1%/w of $CaCl_2$, and (2) spraying said addition solution onto said compound to provide a substantially even coating of said addition solution on said compound.

4,407,724

PROCESS FOR PRODUCING EMULSION

Hermann Perrey, Krefeld; Martin Matner, Odenthal; Ernst Schwinum, Leichlingen, and Hans Rudolph, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

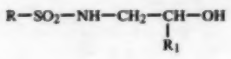
Continuation of Ser. No. 669,638, Mar. 13, 1976, abandoned. This application Apr. 10, 1981, Ser. No. 252,981

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513690

Int. Cl.³ B01F *17/26*

U.S. Cl. 252—312 **3 Claims**

1. A process for producing an emulsion which consists essentially of emulsifying an oily phase and an aqueous phase with an emulsifier consisting of a compound of the formula



wherein

R is straight chain alkyl having 8 to 30 carbon atoms or said alkyl substituted by chlorine and

R_1 is hydrogen or methyl.

4,407,725

REGENERATION OF ACTIVATED CARBON

Hanceford L. Allen, Bartow; William W. Berry, Lakeland, and Robert W. Leibfried, Tampa, all of Fla., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Continuation of Ser. No. 180,050, Aug. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 22,082, Mar. 19, 1979, abandoned. This application Nov. 12, 1981, Ser. No. 320,624

Int. Cl.³ B01J *20/34, 20/20;* **C01B** *25/16*

U.S. Cl. 502—25 **4 Claims**

1. A process for performing repeated regeneration cycles of up to more than 50 times on spent activated carbon over the useful life of said carbon after each use of said carbon to remove humate-type impurities from cooled wet process phosphoric acid that has been treated with clay wherein each of said regeneration cycles consists essentially of the following steps:

(a) contacting said spent activated carbon with a first water wash stream in an amount of 0.5 to 1.5 gal/lb of carbon for a contact time of 15–100 minutes to remove said acidic solution from said carbon;

(b) contacting the water-washed carbon from step (a) with an aqueous caustic wash stream having a free NaOH concentration of at least about 1.5% by weight for a contact time of 60–180 minutes to remove the absorbed humate-type impurities from said carbon; and

(c) contacting the caustic-washed carbon from step (b) with a hot water wash stream at a temperature in the range of about 170° F. to 180° F. to boiling for a length of time sufficient to remove substantially all of the remaining caustic and desorbed humate-type impurities.

2. The process of claim 1 wherein said caustic wash stream has an initial NaOH concentration of from about 5% to about 10% by weight.

3. The process of claim 1 wherein said contacting steps are effected in a carbon absorption column.

4,407,726

PREPARATION OF CARBOXYLIC ACIDS

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Division of Ser. No. 267,963, May 28, 1981, Pat. No. 4,372,889, which is a continuation-in-part of Ser. No. 219,786, Dec. 24, 1980. This application May 12, 1982, Ser. No. 377,537

Int. Cl.³ B01J *27/08*

U.S. Cl. 502—161 **7 Claims**

1. A liquid-phase carbonylation catalyst comprising a molybdenum-nickel or tungsten-nickel co-catalyst component, an organic promoter component and a halide component represented by the following formula X:T:Z:Q, wherein X is molybdenum or tungsten, T is nickel, X and T being in zero valent form or in the form of a halide, an oxide, a carboxylate of 1 to 20 carbon atoms, a carbonyl or a hydride; Z is a halide source which is hydrogen halide, halogen, an alkyl halide wherein the alkyl group contains 1 to 20 carbon atoms or an alkali metal halide, and Q is an organo-phosphorus compound or an organo-nitrogen compound wherein the phosphorus and the nitrogen are trivalent, the molar ratio of X to T being 0.1–10:1, the molar ratio of X+T to Q being 0.05–20:1 and the molar ratio of Z to X+T being 1–1,000:1, the halide being chloride, bromide or iodide, said organo-phosphorus compound being a phosphine of the formula

wherein R^1, R^2 and R^3 may be the same or different, and are alkyl, cycloalkyl, aryl or amide groups or halogen atoms, containing 1 to 20 carbon atoms in the case of alkyl and cycloalkyl groups and 6 to 18 carbon atoms in the case of aryl groups, and said organo-nitrogen compound being a tertiary amine, an amide, a hydroxy amine, a keto amine, a di-, tri-, or other polyamine or a nitrogen-containing compound which comprises two or more other functional groups.

4,407,727

METHOD OF SUPPORTING A CATALYST ON POLYOLEFINS

James J. Harris, and Donald E. Hostetler, both of West Chester, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 8, 1982, Ser. No. 433,566

Int. Cl.³ C08F *4/02*

U.S. Cl. 502—115 **4 Claims**

1. In a method for the preparation of a catalyst for the polymerization of olefins which consists of reducing a transition metal compound selected from the group consisting of the halides, oxyhalides, alcoholates of aliphatic alcohols having 1 to 6 carbon atoms in the alkyl groups, acetates, benzoates, acetylacetonates, and the dicyclopentadienyl salts, with an organomagnesium compound in the presence of a polyolefin support and then deactivating the excess organomagnesium compound with a deactivation agent therefore selected from the group consisting of hydrogen chloride, hydrogen bromide, water, acetic acid, alcohols, carbonic acid, phosphorous pentachloride, silicon tetrachloride, acetylene, and mixtures thereof; sand transition metal being selected from the metals of Groups IV-B, V-B, and VIII of the Periodic System, and said organomagnesium compound being selected from the group consisting of compounds of formula RMgX where R is alkyl having 1 to 20 carbon atoms, or aryl having 6 to 10 carbon atoms and X is R, halide or —OR and complexes of RMgX with organometallic compounds of aluminum or zinc, the improvement consisting of pretreating said polyolefin support by (a) mixing the dry polyolefin powder with 0.1 to 2.0 millimoles of an organomagnesium compound per gram of polyolefin powder and the minimum amount of an inert diluent required to wet the powder mixture, (b) removing diluent until the powder-organomagnesium compound mixture is dry, and (c) treating the powder-organomagnesium compound mixture at a temperature between −50° C. and the softening point of the polymer powder with at least 2 millimoles of a deactivation agent for the magnesium compound per millimole of magnesium compound.

4,407,728
METHOD FOR PRODUCING CRYSTALLINE ALUMINOSILICATES AND THEIR USE AS CATALYSTS AND CATALYST SUPPORTS

William J. Ball, Capel; Keith W. Palmer, Weybridge, and David G. Stewart, Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 969456, Dec. 14, 1978, abandoned. This application Feb. 2, 1981, Ser. No. 230,814

Claims priority, application United Kingdom, Dec. 23, 1977, 53645/77; Jul. 27, 1978, 31636/78

Int. Cl.³ C01B *33/28*

U.S. Cl. 502—60 **23 Claims**

1. A method for preparing a crystalline aluminosilicate having a high silica to alumina molar ratio and an X-ray diffraction pattern substantially the same as that of ZSM-5 zeolite which method comprises mixing a source of silica, a source of alumina, a source of alkali metal, water and at least one alkanolamine according to Formula (I):

(I)

wherein any two of R^1, R^2 and R^3 are independently alkylol groups and the remaining one of R^1, R^2 and R^3 is a hydrogen atom or all of R^1, R^2 and R^3 are independently alkylol groups, the alkylol groups being $—CH_2—R—OH$, wherein R is $—CH_2—$, $—CH_2CH_2—$, or $—CH(CH_3)—$, the ratio of said source of silica to said source of alumina being at least 20:1 based on the equivalent moles of silica and alumina in said respective sources, maintaining said mixture at a temperature above about 120° C. and recovering the crystalline aluminosilicate formed.

23. A method for preparing a crystalline aluminosilicate as defined in either claim 1 or claim 6 wherein said recovered crystalline aluminosilicate is treated with a suitable compound containing a non-metallic element selected from the group consisting of boron and phosphorus to incorporate said non-metallic element into the aluminosilicate.

4,407,729
CATALYSTS

Ignatius Schumacher, Ballwin, and Kang-Bo Wang, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 21, 1981, Ser. No. 313,519

Int. Cl.³ B01J *21/04, 27/02, 27/24*

U.S. Cl. 502—200 **25 Claims**

1. A catalyst composition comprising the adduct of:

(a) an alumina-metal oxide combination represented by the formula

$$(Al_2O_3)_a(M_{2/n}O)_c$$

wherein M is a metal cation selected from the group consisting of the lanthanides, Groups 1b, 2b, 5b, 6b, 7b, and 8 of the Periodic Table of the Elements, and mixtures thereof, and a and c represent weight percent of the Al_2O_3 and $M_{2/n}O$ components, respectively, in the alumina-metal oxide combination, with a being 50 to 100 and c being 0 to 50, and n is an integer from 1 to 7 of the valence of the metal cation, and

(b) a catalytically effective amount of sulfur trioxide.

2. The catalyst composition of claim 1 wherein the amount of sulfur trioxide is in the range from about 5 weight percent to about 40 weight percent, based on the weight of the alumina-metal oxide combination.

3. The catalyst composition of claim 1 wherein the alumina-metal oxide combination is selected from the group cousisting of crystalline and noncrystalline phases, and mixtures thereof.

4,407,730
CATALYTIC SUPPORTS WITH CONTROLLED PORE PROPERTIES

William L. Kehl, Pittsburgh, Pa., assignor to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Jun. 22, 1981, Ser. No. 275,652

The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—208 **5 Claims**

1. A catalyst support consisting essentially of a magnesia-alumina-aluminum phosphate matrix characterized after calcination at 500° C. for 10 hours as amorphous, and having an average pore radius of from about 10 A to about 300 A, a surface area ranging from 100 m^2/g to about 350 m^2/g, a pore volume of from about 0.3 cc/g to about 1.5 cc/g, wherein the magnesia-alumina-aluminum phosphate matrix contains magnesia in an amount ranging from at least about 0.5 mole percent but less than about 10 mole percent, or in the range above about 25 mole percent to about 75 mole percent, alumina in an amount ranging from about two to about 90 mole percent, and aluminum phosphate in an amount ranging from about three to about 95 mole percent, and wherein said matrix retains at least about 90 percent of its surface area when the matrix is additionally calcined at a temperature up to about 750° C. for about 10 hours.

4,407,731
PREPARATION OF METAL OXIDE-SUPPORTED BORON FLUORIDE CATALYSTS

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 8, 1982, Ser. No. 440,112

Int. Cl.³ B01J *21/02*

U.S. Cl. 502—203 **14 Claims**

1. A method for the preparation of a metal oxide-supported boron fluoride catalyst which comprises treating said metal oxide with an aqueous solution of an acid at treating conditions, washing the treated metal oxide with an aqeous solution of an alkaline compound, calcining the resultant treated metal oxide at calcination conditions, impregnating said treated metal oxide with boron trifluoride at impregnation conditions, and recovering the resultant metal oxide-supported boron fluoride catalyst.

4,407,732
CATALYTIC SUPPORTS WITH CONTROLLED PORE PROPERTIES

William L. Kehl, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 22, 1981, Ser. No. 275,653

The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—208 **5 Claims**

1. A catalyst support consisting essentially of a magnesia-alumina-aluminum phosphate matrix characterized after calcination at 500° C. for 10 hours as amorphous, and having an average pore radius of from about 10 A to about 300 A, a surface area ranging from 100 m^2/g to about 350 m^2/g, a pore volume of from about 0.3 cc/g to about 1.5 cc/g, wherein the magnesia-alumina-aluminum phosphate matrix contains magnesia in an amount ranging from about 10 to about 25 mole percent, alumina in an amount ranging from about two to about 85 mole percent, and aluminum phosphate in an amount ranging from at least about three mole percent but less than about 10 mole percent, or in the range above about 65 mole percent to about 85 mole percent, and wherein said matrix retains at least about 90 percent of its surface area when the matrix is additionally calcined at a temperature up to about 750° C. for about 10 hours.

4,407,733

SUPPORTED CATALYSTS AND PROCESS FOR THEIR PREPARATION

Udo Birkenstock, Ratingen, and Herbert Schmidt, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 66,976, Aug. 16, 1979. This application Jul. 20, 1981, Ser. No. 284,752

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2848978

Int. Cl.³ B01J *23/58, 23/78, 23/89*

U.S. Cl. 502—174 27 Claims

1. A supported catalyst comprising an inert support material having a BET surface area of less than 20 square meters per gram and a catalytically active material disposed in an annular zone located inside and just below the surface of said inert support prepared by a process consisting essentially of:

A. contacting said inert support, prior to any impregnation with the catalytically active metal in accordance with its absorbency to saturation, with a solution of a base so as to dispose within said inert support 0.01 to 50 grams equivalents of base per gram equivalent of catalytically active metal to be impregnated within said inert support;

B. drying the so-base-treated inert support at a temperature of 50° to 200° C. so that said inert support has a constant weight and has a residual moisture content of less than 10 percent of the maximum obsorbency of the support; and

C. impregnating the so-dried inert material in accordance with its absorbency to saturation with a solution of a catalytically active metal; and

D. washing, drying and reducing or calcining the so-impregnated inert material.

4,407,734

SPRAY DRIED VANADIA CATALYST AND METHOD OF PREPARING IT

Dean A. Denton, Baltimore, and Raymond D. Feldwick, Timonium, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,685

Int. Cl.³ B01J *21/04, 21/08, 21/12, 23/22*

U.S. Cl. 502—9 20 Claims

1. A catalyst comprising microspherical particles having a weight median particle diameter of from about 5 to about 100 microns and containing in a uniform mixture at least about 25 weight percent of vanadia and at least about 15 weight percent of an aluminosilicate clay inert support having a surface area of less than about 25 square meters per gram.

4,407,735

METHOD OF IMPREGNATING SPHERES OF ACTIVATED ALUMINA FOR USE IN CATALYST SUPPORT WITH CERIUM

Keiichi Sawamura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 26, 1982, Ser. No. 382,282

Claims priority, application Japan, Jun. 19, 1981, 56-93734

Int. Cl.³ B01J *23/10, 37/00*

U.S. Cl. 502—10 8 Claims

1. In a method of impregnating spheres of activated alumina for use in catalyst supports with cerium in an oxidized state, the method having the steps of wetting spheres of activated alumina with an aqueous solution of a cerium salt, drying the wet spheres and calcining the dried spheres in an oxidizing atmosphere,

the improvement comprising performing the step of drying the wet spheres so as to complete the removal of water from the spheres by evaporation in a time period not longer than 10 minutes.

4,407,736

CATALYST AND PROCESS OF PREPARING

Regis J. Pellet; Michael J. Gradassi, both of Wheaton, Ill., and Ralph J. Bertolacini, Chesterton, Ind., assignors to Standard Oil Company, (Indiana), Chicago, Ill.

Division of Ser. No. 92,569, Nov. 8, 1979, Pat. No. 4,298,461. This application Apr. 28, 1981, Ser. No. 258,372

Int. Cl.³ B01J *21/12, 23/64*

U.S. Cl. 502—230 9 Claims

1. A hydrocarbon conversion catalyst comprising at least one platinum-group metal deposited on a composite comprising (1) alumina and (2) rhenium deposited on silica.

2. The catalyst of claim 1 wherein said alumina is substantially free from rhenium deposited thereon.

3. The catalyst of claim 1 comprising said silica in an amount within the range of about 5–35 wt. % based upon the total weight of the catalyst.

4. The catalyst of claim 1 wherein said platinum-group metal comprises platinum.

5. The catalyst of claim 1 wherein said catalyst comprises about 0.01–3 wt. % rhenium, about 0.01–3 wt. % platinum, each being calculated as the element, about 5–35 wt. % silica, and about 65–95 wt. % alumina.

4,407,737

CATALYSTS FOR HETEROGENEOUS SYNTHESIS

Attilio Passariello, Tivoli, Italy, assignor to Ammonia Casale S.A., Lugano, Switzerland

Filed Jan. 19, 1982, Ser. No. 340,888

Claims priority, application Italy, Jan. 21, 1981, 19226 A/81

The portion of the term of this patent subsequent to Feb. 14, 1995, has been disclaimed.

Int. Cl.³ B01J *23/76, 21/12*

U.S. Cl. 502—243 2 Claims

1. In the process for the preparation of catalysts for heterogeneous synthesis, particularly of ammonia, in which a mix of magnetite and promoters, especially oxides of calcium, magnesium, aluminium, potassium and silicon is prepared, the so obtained mix is molten at at least 1,600° C., the molten mass is air cooled, the lump is freed from the slag and crushed, and the so obtained mass is milled in a bar-mill, the relevant powders are pelletised in a tray pelletiser and the so prepared spheres are dried at 100°–150° C. and finally sintered at 1200°–1350° C. in argon atmosphere, the improvement consisting in that the milling of the mass obtained from crushing the lump is carried to reach a content of at least 80% in fine powders having a granulometry from 325 to 400 mesh and in that said fine powders are collected, are pelletised, dryed and sintered.

2. A process according to claim 1, in which said fine powders are treated with an aqueous solution of cerium.

4,407,738

PROCESS FOR PREPARING A PLATINUM/RHODIUM CATALYST

Victoria Eskinazi, Boothwyn; John F. Kirner, Media, both of Pa., and Charles R. Wilson, Swedesboro, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 21, 1981, Ser. No. 333,131

Int. Cl.³ B01J *21/04, 23/42, 23/44, 23/46*

U.S. Cl. 502—334 14 Claims

1. In a method of preparing a platinum/rhodium catalyst having a substantially alumina catalyst support on which there is positioned a first region of platinum having its maximum concentration near the surface of said support and a second region positioned adjacent to said first region and penetrating into said support having a preponderance of the total rhodium metal and a minor amount of the total platinum metal, the improvement which comprises impregnating said support in a single step using a controlled acidic solution of a platinum-containing compound, a rhodium-containing compound, and a strong acid and an ammonium salt or equivalents thereof in amounts to yield at least about 0.01 N solution.

4,407,739
PREPARATION OF ELECTRICALLY CONDUCTIVE POLYMERS

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal, and Johannes Schlag, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 344,020

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104408

Int. Cl.³ H01B 1/02

U.S. Cl. 252—512 **6 Claims**

1. A process for the preparation of a stabilized electrically conductive polymer having a conductivity greater than 10^{-2} S/cm, comprising treating an organic unsaturated polymer of the series of the polyphenylenes, heteropolyphenylenes or polyacetylenes, in the absence of moisture and of oxygen, first with from 0.1 to 10.5% by weight, based on the polymer, of an organic nitroso compound selected from the group consisting of ethyl N-nitroso-N-methylcarbamate, N-nitroso-N-methylurethane, 1-nitrosonaphth-2-ol, 2-nitrosonaphth-1-ol, the ammonium salt of 4-nitroso-N-phenylhydroxylamine (Cupferron), 2-nitroso-toluene, 5-nitroso-2,4,6-triaminopyridine, 3-nitrosostyrene, ω-nitrosostyrene, nitrosobenzene, nitroso-tert.-butane, N-nitroso-dimethylamine, 4-nitroso-N-dimethylaniline, N-(N-nitrosomethylamino)-methyl-benzamide, 2-nitroso-2-naphthol-3,6-disulfonic acid, N-nitrosopyrrolidone and 4-nitrosophenol, at from −100° C. to +100° C. for from 0.1 to about 5 hours, and then with from 0.5 to 55% by weight, based on the polymer, of a strong Lewis acid dopant having a pk_a of from −10 to +4 or a base having a Pauling electronegativity of up to 1.5.

4,407,740
DI- AND TETRA-HYDROBENZOFURANONES AS SCENTS AND AROMA SUBSTANCES

Manfred Köpsel, and Roland Emberger, both of Holzminden, Fed. Rep. of Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Fed. Rep. of Germany

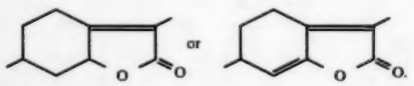
Filed Apr. 23, 1981, Ser. No. 256,748

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017068

Int. Cl.³ A61K 7/46; A23L 2/26

U.S. Cl. 252—522 R **7 Claims**

1. A scenting and/or flavoring composition comprising conventional scenting and/or flavoring agents or carriers and, as a scent and/or flavor modifier thereof, a modifying amount of a di- or tetra-hydrobenzofuranone of the formula



4,407,741
HYDROTROPIC CLEANER

Richard D. Maggi, Oyster Bay, N.Y., assignor to Life Industries Corporation, Old Bethpage, N.Y.

Continuation-in-part of Ser. No. 937,327, Aug. 28, 1978, abandoned. This application Jan. 27, 1982, Ser. No. 343,027

The portion of the term of this patent subsequent to Mar. 8, 2000, has been disclaimed.

Int. Cl.³ C11D 1/70, 1/825, 3/28, 3/43

U.S. Cl. 252—542 **11 Claims**

1. A cleaning composition comprising (a) about 0.22 to 0.33 parts by weight of methyl-2 pryyolidone, (b) about 1.5 to 2 parts by weight of an alkylaryl polyether alcohol obtainable as the reaction product of octylphenol and ethylene oxide and containing an average of five ethylene oxide units per molecule and (c) one part by weight of an alkylaryl polyether alcohol obtainable as the reaction product of octylphenol and ethylene oxide and containing an average of seven to eight ethylene oxide units per molecule.

2. The composition of claim 1 further including water.

4,407,742
PROCESS FOR CONDITIONING RADIOACTIVE AND TOXIC WASTES

Milan Hrovat, Rodenbach; Hans Huschka, and Lothar Rachor, both of Hanau, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Apr. 25, 1980, Ser. No. 143,941

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917437

Int. Cl.³ G21F 9/16

U.S. Cl. 252—628 **13 Claims**

1. A process for conditioning radioactive and toxic wastes for the transportation and final storage through binding the waste in a carbon matrix comprising employing as the starting material for the carbon matrix natural graphite and pressing with sulfur as a binder at a temperature above 100° C. and in the melting range of sulfur to form a molded article.

4,407,743
NOVEL N,N'-BIS(TRIFLUOROMETHYLSULFONYL)OXAMIDES AND CHEMILUMINESCENT COMPOSITIONS CONTAINING THE SAME

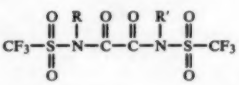
Shin-Shyong Tseng, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 19, 1982, Ser. No. 359,728

Int. Cl.³ C09K 11/06

U.S. Cl. 252—700 **10 Claims**

1. A compound having the formula



(I)

wherein R and R' independently represent substituted alkyl of 1 to 6 carbon atoms wherein the substituents are selected from trihalomethyl, C_1–C_6 alkoxycarbonyl, or C_6–C_{10} arylalkoxycarbonyl wherein the alkoxy moiety is of 1 to 6 carbon atoms.

4,407,744
PROCESS FOR OBTAINING NERVE GROWTH FACTOR

David M. Young, 60 Farm Rd., Sherborn, Mass. 01770

Division of Ser. No. 854,194, Nov. 23, 1977, Pat. No. 4,185,095. This application Feb. 5, 1979, Ser. No. 9,017

Int. Cl.³ C07G 7/00; A61K 37/00

U.S. Cl. 260—112 R **1 Claim**

1. The process for obtaining a composition useful as plasminogen activator comprising a nerve growth factor having a molecular weight of about 116,000, said composition being derived from either mouse submandibular gland or from mouse saliva which composition is free from the components of mouse saliva or mouse gland which degrade the nerve growth factor which comprises forming an aqueous extract of mouse submandibular gland or mouse saliva, said aqueous extract having a pH between about 6 and 9 and an ionic strength between about 0.01 and 0.2, said extract being formed prior to substantial degradation of nerve growth factor having a molecular weight of about 116,000 contained in said extract, passing said extract through a column of a positively charged ion exchange resin to form a component rich in said nerve growth factor and substantially free of components of said mouse saliva or mouse submandibular gland that degrades said nerve growth factor, eluting said column with an aqueous salt solution to recover said component rich in nerve growth factor, passing said component rich in nerve growth factor through a chromatographic column of neutral resin to further separate

nerve growth factor from said component rich in nerve growth factor and eluting said neutral resin column with an aqueous salt solution to recover a second component having an increased concentration of said nerve growth factor, passing said second component having an increased concentration of said nerve growth factor through at least one additional neutral resin column and eluting each of said additional columns with an aqueous salt solution in order to recover pure stable nerve growth factor having a molecular weight of about 116,000.

4,407,745

HEPTACOSAPEPTIDE

Mikio Uchiyama, Urawa; Takashi Sato, Tokyo; Hiroshi Yoshino, Abiko; Yutaka Tsuchiya, Tokyo; Masayuki Konishi, Ichinomiya; Masahiko Tsujii, Kagamihara; Yoshihiko Hisatake, Kounan, and Atsushi Koiwa, Gifu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 300,857

Claims priority, application Japan, Sep. 11, 1980, 55-125262

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **11 Claims**

1. A heptacosapeptide having the following structural formula:

Boc-His(Boc)-Ser(Bu^t)-Asp(OBu^t)-Gly-Thr(Bu^t)-Phe-Thr(Bu^t)-Ser(Bu^t)-Glu-(OBu^t)-Leu-Ser(Bu^t)-Arg(X)-Leu-Arg(X)-Asp(OBu^t)-Ser(Bu^t)-Ala-Arg(X)-Leu-Gln-Arg(X)-Leu-Leu-Gln-Gly-Leu-Val-NH_2,

in which X is a group having the formula:

wherein R is alkyl or alkoxy and m is an integer of 1 to 3, provided that the R's are the same or different when m is 2 or 3.

4,407,746

CYCLOHEXYL AND PHENYL SUBSTITUTED ENKEPHALINS

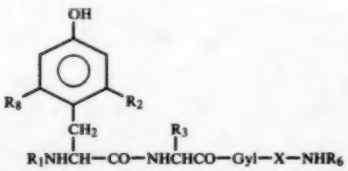
Robert H. Mazur, Chicago; David A. Tyner, Glenview, and Eleanor A. Hallinan, Evanston, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 14, 1981, Ser. No. 330,614

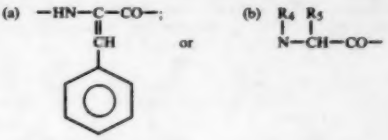
Int. Cl.³ C07C *103/52*; A61K *37/00*

U.S. Cl. 260—112.5 E **9 Claims**

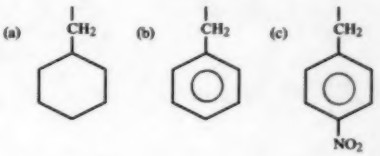
1. A compound according to the formula



wherein R_1 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
wherein R_2 and R_8 are:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive; R_2 and R_8 each being the same of different;
wherein R_3 is:
(a) alkylthioalkyl having 2 to 6 carbon atoms, inclusive;
(b) alkylsulfinylalkyl have 2 to 6 carbon atoms, inclusive;
wherein X is:



wherein R_4 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
wherein R_5 is:



wherein R_6 is:
(a) cyclohexyl; substituted 2, 3 or 4 by R_7; or
(b) phenyl; substituted ortho, meta or para by R_7;
wherein R_7 is:
(a) hydrogen;
(b) alkyl ester of carboxylic acid of 1 to 6 carbon atoms, inclusive.
(c) hydroxyalkyl of 1 to 6 carbon atoms, inclusive; and the pharmaceutically acceptable salts.

4,407,747

CONTINUOUS METHOD FOR DISSOLVING MILK PROTEINS CONTAINING CASEIN AND AN APPARATUS FOR PERFORMING THE METHOD AS WELL AS WATER SOLUBLE MILK PROTEIN PRODUCTS OF A NOVEL TYPE

Frank Lippe, Veghel; Henricus A. W. E. M. Ottenhof, and Rudolf De Boer, both of Wageningen, all of Netherlands, assignors to Stichting Nederlands Instituut Voor Zuivelonderzoek (NIZO), Netherlands

Filed Oct. 28, 1980, Ser. No. 201,419

Claims priority, application Netherlands, Aug. 13, 1980, 8004587

Int. Cl.³ A23J *1/20*

U.S. Cl. 260—120 **17 Claims**

1. A continuous method for dissolving milk proteins containing water insoluble casein comprising (a) simultaneously admixing said milk proteins with at least one solubilizer and with water, (b) passing the milk proteins, the solubilizer, and the water in a continuous stream through a closed reaction chamber by means of a positive displacement pump, and (c) converting the mixture within said reaction chamber under the influence of shearing forces at a temperature of at least 60° C. and at a final pH value of at least 6.5 into a solution having a dry solids content within the range of from 27 to 60% by weight.

4,407,748

AZO DYESTUFFS POSSESSING ANTIMICROBIAL PROPERTIES

Irina N. Gorbacheva; Zinaida J. Kozinda; Elena G. Suvorova; Viktor A. Chertov; Semen I. Dvoskin; Evdokia V. Platonova; Tatyana A. Podgaevskaya, and Andrei B. Skvirenko, all of Moscow, U.S.S.R., assignors to Tsentralny Nauchno-Issledovatelsky Institut, Moscow, U.S.S.R.

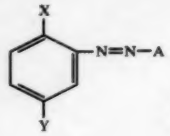
Filed Mar. 13, 1980, Ser. No. 129,903

Claims priority, application U.S.S.R., Mar. 13, 1979, 2729601

Int. Cl.[3] **C09B** *62/09, 62/503;* **D06P** *1/382, 1/384*

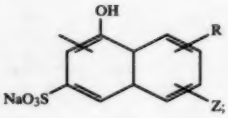
U.S. Cl. 260—153 **2 Claims**

1. An azo dyestuff composition of matter possessing antimicrobial properties, having the formula:



wherein

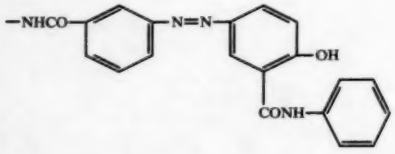
A is



X is $-OCH_3$;

Y is $-SO_2CH_2CH_2OSO_3Na$;

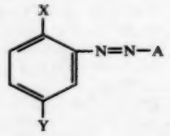
Z is



and

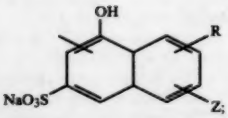
R is —H.

2. A azo dyestuff composition of matter possessing antimicrobial properties, having the formula:



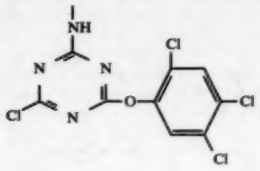
wherein

A is



X is $-SO_3Na$;

Y is



Z is $-SO_3Na$; and

R is —H or $-NH_2$.

4,407,749

AZO DYES FROM 2-SULFONATED, SULFATED OR THIOSULFATED ORGANOTHIOTHIADIAZOLE AND ANILINE, TETRAHYDROQUINOLINE, OR BENZOMORPHOLINE COUPLERS

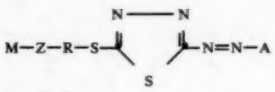
Max A. Weaver; Clarence A. Coates, Jr., and John G. Fisher, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 174,055, Jul. 31, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 383,885

Int. Cl.[3] **C09B** *29/049, 29/08, 29/36, 29/44*

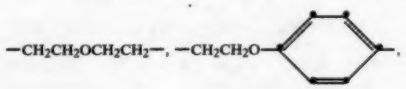
U.S. Cl. 260—155 **11 Claims**

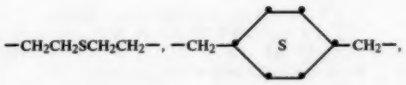
1. A compound having the formula



in which R is

$-C_2H_4-$, $-CH(CH_3)CH_2CH_2-$, $-CH_2CH(OH)CH_2-$,

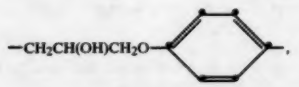




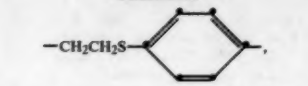
$-CH_2CH_2NHCOCH_2-$, $-CH_2CH_2SO_2NHCH_2CH_2-$,

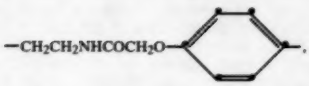
$-CH_2CH(SO_3K)CH_2-$, $-CH_2\underset{|}{C}HCH_2OC_2H_5$,

$-CH_2CH_2NHSO_2CH_2CH_2-$, $-CH_2CH_2OCOCH_2-$,



-continued



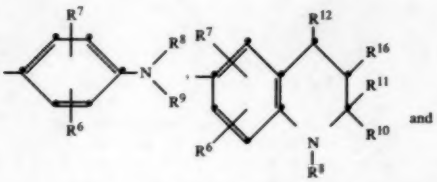


$-CH_2CH_2-N(SO_2CH_3)-CH_2CH_2-$,

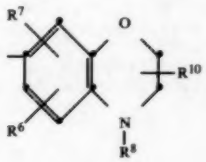
$-CH_2CH(OSO_3Na)CH_2-$, or $-CH_2CH(SSO_3Na)CH_2-$;

Z is SO_3, SO_4, or SSO_3; M is hydrogen,

an alkali metal or ammonium; and A is selected from coupler moieties of the formulae



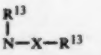
and



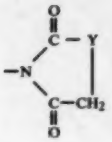
wherein

R^6 and R^7 are each selected from hydrogen, fluorine, chlorine, bromine, lower alkyl, cycloalkyl, lower alkoxy, phenoxy, lower alkylthio, arylthio, and —NH—X—R^{13} in which X is —CO—, —COO—, or —SO_2— and R^{13} is selected from aryl, cycloalkyl, lower alkyl and lower alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, lower alkylsulfonyl, lower alkylthio, lower alkanoyloxy, and lower alkoxy, and when X is —CO—, R^{13} is also selected from hydrogen, amino, lower alkylamino, lower alkylcarbamoyl, lower dialkylamino, arylamino, and furyl;

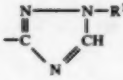
R^8 and R^9 are selected from hydrogen; cycloalkyl; cycloalkyl substituted with one or two groups selected from lower alkyl, —OH, lower alkoxy, halogen and hydroxy substituted lower alkyl; phenyl or phenyl substituted with lower alkyl, lowr alkoxy, halogen, lower alkanoylamino, cyano or lower alkoxycarbonyl; straight or branched lower alkenyl; straight or branched alkyl or 1–8 carbons and such alkyl substituted with the following: hydroxy; halogen; cyano; succinimido; glutarimido; phthalimidino; 2-pyrrolidono; cyclohexyl; phenyl or phenyl substituted with 1–3 of lower alkyl, halogen, cyano, sulfamoyl, OH, OR^{13}, OXR^{13}, SR^{13}, $NHXR^{13}$, SO_2NHR^{13}, $O(CH_2)_nXR^{13}$, $O(CH_2)_nOR^{13}$, or



where n is 1–6; lower alkanoylamino; sulfamoyl, lower alkylsulfamoyl; vinylsulfonyl; acrylamido; phthalimidinyl; benzoylsulfonicimidyl; lower alkylsulfonamido; phenylsulfonamido; lower alkoxycarbonylamino; lower alkylcarbamoyloxy; lower alkoxycarbonyl; lower alkoxycarbonyloxy;



wherein Y is —NH—, —NH—lower alkyl—, —O—, —S—, or —CH_2O—; —S—R^{14} wherein R^{14} is lower alkyl, phenyl, phenyl substituted with halogen, lower alkyl, lower alkoxy, lower alkanoylamino, cyano, or lower alkoxycarbonyl, pyridyl, pyrimidinyl, benzoxazolyl, benzimidazolyl, benzothiazolyl, or



—SO_2R^{13}; —$COOR^{13}$; —OXR^{13}; —NH—X—R^{13}; —X—R^{13}; —OCO—R^{13}; —$CONR^{15}R^{15}$; —$SO_2NR^{15}R^{15}$; wherein R^{13} and X are as defined above and each R^{15} is selected from H and R^{13}; lower alkoxy, lower alkoxy substituted with hydroxy, cyano, lower alkanoyloxy, or lower alkoxy; phenoxy; phenoxy substituted with one or more of lower alkyl, lower alkoxy or halogen; or R^8 and R^9 combined form pentamethylene, ethyleneoxyethylene or ethylenesulfonylethylene;

R^{10}, R^{11}, and R^{12} are each selected from hydrogen and lower alkyl; and R^{16} is selected from —OH, —Cl, —$CONH_2$, —CONH—lower alkyl, lower alkoxy, phenoxy, —SR^{14}, and —OXR^{13} wherein R^{13} and R^{14} are as defined above.

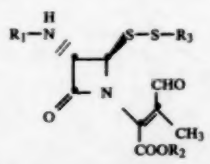
4,407,750

UNSYMMETRICAL AZETIDINONE ALDEHYDE DISULFIDES AND PROCESS

Stjepan Kukolja, Carmel, and Janice L. Pfeil, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 137,861, Apr. 7, 1980, Pat. No. 4,302,391.
This application Aug. 7, 1981, Ser. No. 290,919
Int. Cl.[3] **C07D** *205/08, 405/06, 403/06, 409/06*
U.S. Cl. 260—239 A **14 Claims**

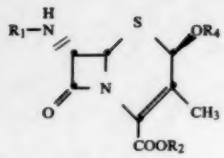
1. A process for preparing an azetidinone disulfide compound of the following formula:



I

which comprises

reacting at a temperature between about 0° C. and about 30° C. a 2α-alkoxy cephalosporin ester compound of the formula



II

with between about 0.8 to about 1.2 equivalents of phenylsulfenyl chloride or a monosubstituted phenylsulfenyl chloride, wherein the substituent is selected from the group consisting of chloro, methoxy, methyl and acetoxy, per equivalent of the 2α-alkoxy cephalosporin ester in an aromatic hydrocarbon or chlorinated hydrocarbon solvent,

wherein the above formulae R_1 is an acyl group of the formula

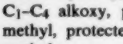
wherein R' is

(a) C_1–C_7 alkyl, cyanomethyl, C_1–C_6 haloalkyl, 4-protected amino-4-protected carboxybutyl; or

(b) C_1–C_6 alkoxy, phenoxy, benzyloxy or 4-methoxybenzyloxy; or

(c) the group —R'' wherein R'' is phenyl or substituted phenyl wherein the substituents are 1 or 2 halogens, protected hydroxy, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, protected carboxy, protected carboxymethyl, protected hydroxymethyl or protected aminomethyl; or

(d) an arylalkyl group of the formula

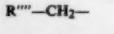


wherein m is 0 or 1; or

(e) a substituted arylalkyl group of the formula

wherein R''' is R'' as defined above, 2-thienyl, 3-thienyl, 2-furyl or 3-furyl; W is protected hydroxy, protected carboxy, protected amino, or

(f) a heteroarylmethyl group of the formula



wherein R'''' is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl; R_2 is a carboxy protecting group, R_3 is phenyl or a mono substituted phenyl group where the substituents are chloro, methoxy, methyl or acetoxy and R_4 is methyl, ethyl or isopropyl.

4,407,751

PROCESSES FOR PREPARING β-LACTAMS

Wagn O. Godtfredsen, Vaerlose, and Welf von Daehne, Rungsted Kyst, both of Denmark, assignors to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab), Ballerup, Denmark

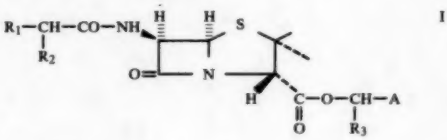
Continuation of Ser. No. 213,083, Dec. 4, 1980, Pat. No. 4,342,772, which is a continuation-in-part of Ser. No. 118,063, Jan. 24, 1980. This application Aug. 7, 1981, Ser. No. 291,081

Claims priority, application United Kingdom, Feb. 13, 1979, 7905020; Jun. 19, 1979, 7921341; Aug. 9, 1979, 7927761; Nov. 14, 1979, 7939473; Jan. 25, 1980, 8002682

Int. Cl.³ C07D *499/04*

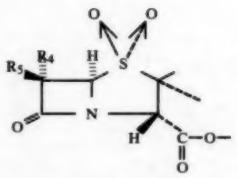
U.S. Cl. 260—239.1 **7 Claims**

1. A method for producing a compound of formula I

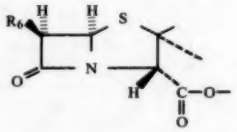


I

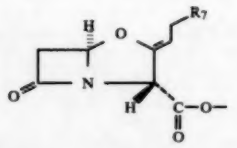
in which R_1 stands for a phenyl, 4-hydroxyphenyl, 1,4-cyclohexadienyl or a 3-thienyl group; R_2 represents a primary amino or a carboxy group; R_3 is a hydrogen atom, or a lower alkyl, aryl or aralkyl radical, and A stands for a radical of a β-lactamase inhibitor containing a β-lactam ring as well as a carboxy group, A being connected via the carboxy group, and salts of the compounds of formula I with pharmaceutically acceptable, non-toxic acids or bases, said A substituent being a radical selected from the group consisting of



II

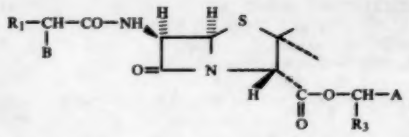


III



IV

in which R_4 stands for a hydrogen or a halogen atom; R_5 is a hydrogen atom or an amino or acylamino group, but at least one of R_4 and R_5 is hydrogen; R_6 represents a halogen atom; and R_7 stands for a hydroxyl group, or one of the radicals of known clavulanic acid derivatives with β-lactamase inhibitory activity, wherein a compound of formula V:



V

in which R_1, R_3, and A are as defined above, B stands for an azido group, a protected amino group, or a protected carboxy group, is subjected to a catalytic hydrogenolysis or hydrolysis depending on what A and B stand for.

4,407,752

AZETO-IMIDAZO-DIAZEPINES

Walter Hunkeler, Magden, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

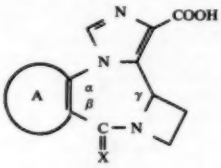
Division of Ser. No. 349,405, Feb. 16, 1982, Pat. No. 4,352,816. This application Jul. 30, 1982, Ser. No. 403,952

Claims priority, application Switzerland, Feb. 27, 1981, 1339/81

Int. Cl.³ C07D *487/12, 512/22*

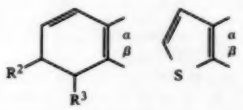
U.S. Cl. 260—239.3 P **2 Claims**

1. A compound of the formula



VIII

wherein A together with the two carbon atoms denoted as α and β is the group



(a) or (b);

wherein R^2 is hydrogen, trifluoromethyl or halogen; R^3 is hydrogen, trifluoromethyl, halogen or lower alkyl and X is an oxygen or sulphur atom.

4,407,753

8α-OESTRA-1,3,5(10)-TRIENE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Marinus B. Groen, Schayk, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

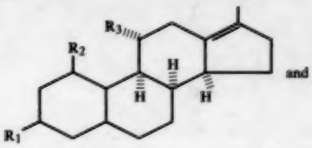
Filed Jul. 2, 1981, Ser. No. 280,266

Claims priority, application Netherlands, Jul. 11, 1980, 8003999

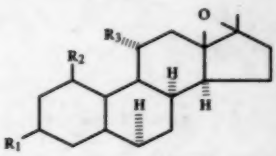
Int. Cl.³ C07J *71/00*

U.S. Cl. 260—239.55 R **1 Claim**

1. A compound selected from the group consisting of



and



wherein

R_1=H, hydroxy, (C_1–C_8)-hydrocarbyloxy, trimethylsilyloxy, tetrahydropyranyloxy or (C_1–C_7)-carboxyacyloxy;

R_2=H or equal to R_1; with the proviso that at least one of the substituents R_1 and R_2 is not equal to H; and

R_3=methyl or ethyl.

4,407,754

CHOLECALCIFEROL DERIVATIVES

Richard Barner, Witterswil, and Josef Hubscher, Seon, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 333,354, Dec. 22, 1981, abandoned, which is a continuation of Ser. No. 183,140, Sep. 2, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,438

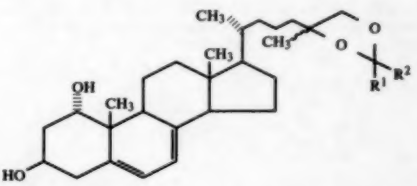
Claims priority, application Switzerland, Sep. 14, 1979, 8346/79

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—239.55 D **16 Claims**

5. A cholestadiene of the formula

IV



wherein R^1 and R^2 are lower-alkyl or R^1 and R^2 together are lower-alkylene.

4,407,755

6-AMINO PENAM DERIVATIVES

Robert L. Cundall, Liverpool, and Derek Walker, Jamesville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

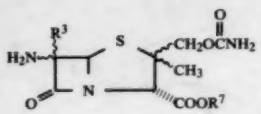
Division of Ser. No. 92,248, Nov. 7, 1979, Pat. No. 4,310,459, which is a division of Ser. No. 893,092, Apr. 3, 1978, Pat. No. 4,322,347. This application Aug. 3, 1981, Ser. No. 289,621

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.³ C07D *499/02*

U.S. Cl. 260—245.2 R **4 Claims**

1. A compound of the formula



in which R^3 is hydrogen, (lower)alkoxy or (lower)alkylthio and $COOR^7$ is carboxy or a conventionally protected carboxyl group.

4,407,756

PROCESS FOR PRODUCING AMINOANTHRAQUINONE

Akira Fukasawa, Toyonaka; Masakatsu Yoshimura, Sakai; Tatsuo Kaneoya, Minoo, and Kenji Takahashi, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 16, 1979, Ser. No. 39,606
Claims priority, application Japan, May 26, 1978, 53-63543
Int. Cl.³ C07C *97/24*
U.S. Cl. 260—378 **14 Claims**

1. A process for producing an aminoanthraquinone by reduction of a nitroanthraquinone, whichcomprises carrying out the reduction in an aqueous medium while feeding a nitroanthraquinone and an alkali sulfide into a reaction zone kept at a temperature of from 80° to 140° C., the alkali sulfide being used in an amount of 1.6 or more times the mole number of the nitro group, and while withdrawing the reaction product from the reaction zone.

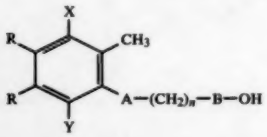
4,407,757

ARALKYL CARBOXYLIC ACID COMPOUNDS

Hiroshi Morimoto, Hyogo; Isuke Imada, Osaka; Masazumi Watanabe, Osaka, and Mitsuru Kawada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 961,021, Nov. 15, 1978, Pat. No. 4,271,083, which is a division of Ser. No. 573,158, Apr. 30, 1975, Pat. No. 4,139,545. This application Dec. 31, 1980, Ser. No. 221,613
Claims priority, application Japan, May 2, 1974, 49-50003
Int. Cl.³ C11C *1/00, 3/02*
U.S. Cl. 260—413 **20 Claims**

1. A compound of the formula



wherein R represents alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms, A represents —CH_2—, —CO— or

B represents —CH_2— or —CO—, n represents an integer of 1 to 8, X represents hydrogen or hydroxyl and Y represents hydroxyl, or the corresponding ester with methanol at the function shown by —B—OH when B is —CO—, or the corresponding ester with acetic acid at the function shown by —B—OH when B is —CH_2—.

4,407,758

DIALKYLZINC COMPOSITIONS HAVING IMPROVED THERMAL STABILITY

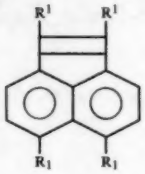
Alfred K. Jung, Queens, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 30, 1981, Ser. No. 316,597
The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.
Int. Cl.³ C07F *3/06*
U.S. Cl. 260—429.9 **8 Claims**

1. A dialkylzinc composition having improved stability against thermal decomposition comprising a dialkylzinc compound represented by the formula

R-Zn-R

wherein R represents an alkyl radical having from 1 to about 8 carbon atoms, in admixture with an acenaphthylene compound represented by the formula



wherein each R^1 independently represents an alkyl radical, an olefin radical conjugated with the aromatic moiety, an aryl radical or a substituted aryl radical, each having from 1 to about 12 carbon atoms, or hydrogen; said acenaphthylene compound being present in an amount sufficient to reduce the thermal decomposition rate of said dialkylzinc compound.

4,407,759

PHOTOINITIATORS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 150,974, May 19, 1980, abandoned, which is a continuation of Ser. No. 13,166, Feb. 21, 1979, abandoned, which is a continuation of Ser. No. 833,146, Sep. 14, 1979, Pat. No. 4,161,478, which is a continuation-in-part of Ser. No. 789,419, Apr. 21, 1977, Pat. No. 4,136,102, which is a division of Ser. No. 574,006, May 2, 1975, which is a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Dec. 10, 1981, Ser. No. 329,485
Int. Cl.³ C07F *9/66, 9/90, 9/02*
U.S. Cl. 260—440 **8 Claims**

1. A Group VIa onium salt having an MF_6 anion, where M is selected from phosphorous, arsenic and antimony, and a sulfur containing cation whose valence of three is satisfied by hydroxy substituted $C_{(6-20)}$ monovalent aromatic organic radical and two radicals selected from $C_{(1-8)}$ alkyl, cycloalkyl, —$C_2H_4OCH_3$, —$CH_2COOC_2H_5$, —CH_2COCH_3, and a mixture thereof.

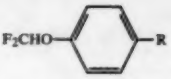
4,407,760

METHOD FOR THE PREPARATION OF DIFLUOROMETHOXYAROMATIC COMPOUNDS

Jack K. Siddens, Princeton Junction, N.J., assignor to American Cyanamid Company, Stamford, Conn.

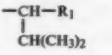
Filed Sep. 20, 1982, Ser. No. 420,169
Int. Cl.³ C07C *121/75, 43/225, 69/712, 79/35*
U.S. Cl. 260—465 F **9 Claims**

1. A method for the preparation of a compound of structural formula-(I)



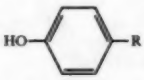
(I)

wherein R is C_1–C_3 alkyl, halogen, nitro or the moiety



wherein R_1 is CN, $COOR_2$, OH or OR_3; R_2 is C_1–C_3 alkyl; R_3 is tosyl, mesyl or C_2–C_4 alkanoyl; comprising:

reacting one molar equivalent of a compound of structural formula-(II)



(II)

and R is as hereinabove defined, at a temperature of from 20° to 40° C. in the presence of 1740 to 2614 mol percent of water, 1:1 acetone:2-propanol used at a rate of 4 ml to 6 ml per gram of the compound of formula-(II), and 10 mol percent of benzyltriethylammonium chloride with two to three molar equivalents of chlorodifluoromethane added under a pressure of from 0.4 to 2.5 kg cm^{-2} over a period of from 30 minutes to 1.0 hour while simultaneously

adding to the pressurized reaction mixture an aqueous solution of four molar equivalents of an alkali metal hydroxide of sodium or potassium hydroxide over a 1 to 4 hour period, wherein the concentration of said aqueous solution is such that on completion of the addition the total amount of water added to the reaction mixture is from 2614 to 3482 mol percent; after the completion of the addition the reaction mixture is further maintained at the above pressure and temperature ranges for a period of from 0.1 to 6 hours or until said reaction is essentially complete.

4,407,761

PROCESS FOR THE PRODUCTION OF ω-AMINO-1-HYDROXYALKYLIDENE-1,1-BISPHOSPHONIC ACID

Helmut Blum, and Karl-Heinz Worms, both of Dusseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

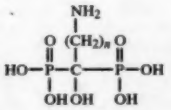
Filed Apr. 16, 1981, Ser. No. 254,918

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1980, 3016289

Int. Cl.³ C07F *9/38*

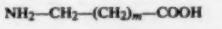
U.S. Cl. 260—502.5 C **4 Claims**

1. A process for the preparation of a ω-amino-1-hydroxyalkylidine-1,1-bisphosphonic acid of the formula:



wherein n is an integer from 3 to 5, consisting essentially of the steps of:

(1) reacting an aminocarboxylic acid of the formula:



wherein m is an integer from 2 to 4, with a phosphonating reactant selected from the group consisting of:

(a) a mixture of phosphorous acid and PCl_3,

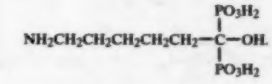
(b) a mixture of phosphorous acid and PCl_5, and

(c) a mixture of phosphorous acid and $POCl_3$

(2) hydrolyzing the reaction mixture with concentrated hydrochloric acid which does not oxidize aminophosphonic acids, by heating, and

(3) recovering said ω-amino-1-hydroxyalkylidene-1,1-bisphosphonic acid.

4. 6-Amino-1-hydroxyhexylidene diphosphonic acid of the summary formula (1):



4,407,762

PROCESS FOR THE ISOLATION OF 1-NAPHTHYLAMINE-4,8-DISULPHONIC ACID

Heinz U. Blank; Horst Behre, both of Odenthal; Hans W. Linden, Leverkusen, and Werner Mentzel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 23, 1982, Ser. No. 410,746

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1981, 3135391

Int. Cl.³ C07C *143/60*

U.S. Cl. 260—508 **9 Claims**

1. In the process for the isolation of 1-naphthylamine-4,8-disulphonic acid from sulphonation mixtures containing it by introducing these sulphonation mixtures into water, the improvement comprising introducing the sulphonation mixture containing 1-naphthylamine-4,8-disulphonic acid, in the presence of at least one equivalent of alkali metal ions, into water, if appropriate preheated, so that a temperature of at least 100° C. is reached at the start of crystallisation of the 1-naphthylamine-4,8-disulphonic acid and the separation of 1-naphthylamine-4,8-disulphonic acid from the mother liquor is carried out at a temperature not higher than 70° C.

4,407,763

THIOSULFENAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINONITRILES

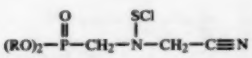
James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 5, 1981, Ser. No. 309,321

Int. Cl.³ C07F *9/40*; C07D *317/56*

U.S. Cl. 260—940 **2 Claims**

1. A compound of the formula



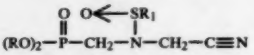
wherein R is selected from the group consisting of phenyl, naphthyl or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, alkoxycarbonyl, methylenedioxy, trifluoromethyl, cyano, nitro and halogen.

4,407,764
N-ARYLSULFINYL N-PHOSPHONOMETHYLGLYCINONITRILES

James A. Sikorski, West Lafayette, Ind., and Mary A. Hoobler, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 31, 1981, Ser. No. 298,056
Int. Cl.³ C07F 9/40; A01N 57/20
U.S. Cl. 260—940 6 Claims

1. A compound of the formula



wherein R is selected from the group consisting of phenyl, naphthyl or biphenylyl; or phenyl, naphthyl or biphenylyl substituted with from 1 to 3 substituents independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and methylenedioxy, and R_1 is phenyl or phenyl substituted with from 1 to 3 substituents selected from the group consisting of lower alkyl and lower alkoxy.

4,407,765
SYNTHESIS OF ORGANIC PHOSPHATE-PHOSPHONATES

Thomas A. Hardy, Fairfield, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 165,428, Jul. 2, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 332,394
Int. Cl.³ C07F 9/09
U.S. Cl. 260—970 13 Claims

1. A process for the preparation of organic phosphate-phosphonates comprising the steps of:

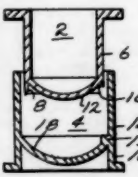
(a) reacting an organic acylating agent with an organic phosphite triester to form an intermediate followed by

(b) reacting the intermediate with an organic phosphite diester in the presence of from about 3 to about 20 percent by weight based on the weight of phosphite diester of a tertiary amine.

4,407,766
MOLDS AND PROCEDURE FOR PRODUCING TRUNCATED CONTACT LENSES

Henry Haardt, Henryville, Pa.; John Magdon, Phillipsburg, N.J., and Eric Noble, Smithtown, N.Y., assignors to National Patent Development Corporation, New York, N.Y.

Filed May 26, 1981, Ser. No. 266,782
Int. Cl.³ B29D 11/00
U.S. Cl. 264—2.2 25 Claims



1. A mold for producing a truncated contact lens comprising:

a male portion including a substantially cylindrical support portion and a first optical molding surface having a principal longitudinal axis, said molding surface having a predetermined curvature to form a first optical surface of said desired contact lens;

a female portion including a second optical molding surface having a principal longitudinal axis having a predetermined curvature to form a second optical surface of said desired contact lens, said female portion comprising a hollow cylindrical portion having an open upper end and a closed lower end;

one of said optical molding surfaces having a periphery composed of a circular portion having two ends and a straight line connecting the two ends defining a chord whereby the chord defines the truncation on the molded contact lens; and

a continuous, flexible rim portion provided about said periphery integral with said optical molding surface and having in its circular portion an axis common with the principal longitudinal axis of the mold portion to which it is attached.

10. A process of producing truncated contact lens in a single direct casting procedure comprising the steps of:

(a) charging a mixture comprising vulcanizable or polymerizable constitutents to a first mold portion of a thermoplastic mold for producing a contact lens, said thermoplastic mold comprising:

(i) a first mold portion including a first molding surface having a principal longitudinal axis, said first molding surface having a predetermined curvature to form a first surface of the desired contact lens;

(ii) a second mold portion including a second molding surface having a principal longitudinal axis, said second molding surface having a predetermined curvature to form a second surface of the desired contact lens;

one of said molding surfaces having a periphery composed of a circular portion having two ends and a straight line connecting the two ends defining a chord whereby the chord defines the truncation on the molded contact lens; and

(iii) a continuous, flexible rim portion provided about said periphery, integral with said molding surface and having in its circular portion an axis common with the principal longitudinal axis of the mold portion to which it is attached;

(b) closing the mold by placing the first mold portion and the second mold portion in alignment with each other such that the principal longitudinal axes of the mold portions coincide with each other and in a manner whereby the flexible rim portion is seated circumferentially on the opposite molding surface while retaining said mixture between said molding surfaces and said flexible rim portion to form a totally enclosed space; and

(c) subjecting the resulting closed mold system to activating conditions for a period of time sufficient to effect the desired degree of vulcanization or polymerization of said mixture while causing the flexible rim portion to flex in a generally uniform manner with respect to the axis of said molding surface such that said mold portions approach each other during vulcanization or polymerization; and

(d) recovering the resulting product having the shape of a truncated contact lens.

4,407,767
DRAWING AND BEAMING A WEFTLESS WARP OF YARNS

Douglas K. Seaborn, Cantonment, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 89,810, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 62,269, Jul. 30, 1979, abandoned, which is a continuation of Ser. No. 960,159, Nov. 13, 1978, abandoned. This application May 20, 1982, Ser. No. 380,371
Int. Cl.³ B29C 17/02; D02H 5/02, 13/08
U.S. Cl. 264—40.1 2 Claims

1. A beaming process, comprising sequentially:

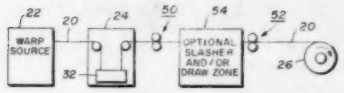
a. feeding a weftless warp sheet of spun yarns from a source through a tension detector;

b. drawing said warp sheet; and

c. winding said warp sheet onto a beam;

d. said tension detector comprising:

(1) a yarn accumulator for continuously storing a quantity of each yarn constituting said warp sheet; and
(2) means, responsive to occurrence of tension in any



given one of said yarns equal to a predetermined level, for releasing the stored quantity of said given one yarn whereby the tension in said given one yarn does not exceed said predetermined level.

4,407,768

FOAMABLE POLYMERIC COMPOSITION COMPRISING PROPYLENE POLYMER AND HYDRATED ALUMINA

Rodrigo A. Garcia, Pasadena; Roel Moreno, Houston, both of Tex., and Robert J. Martinovich, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 8, 1982, Ser. No. 337,925
Int. Cl.³ B29H *7/20*
U.S. Cl. 264—54 **15 Claims**

1. A foamable thermoplastic composition comprising a propylene polymer selected from the group of resinous homopolymers of propylene and copolymers of propylene copolymerized with a minor amount of one or more comonomers selected from the group consisting of aliphatic mono-1-olefins containing from 2 to about 10 carbon atoms, said composition having dispersed therein a filler precursor and sole blowing agent being particulate hydrated alumina of the formula $Al_2O_3.x-H_2O$, wherein x has any value from 1 to 3.

4,407,769

METHOD OF MANUFACTURING CEMENT PRODUCTS HAVING SUPERIOR MECHANICAL STRENGTH

Shozo Harada, Tokoname; Kazuo Ito, Tokai; Takayuki Shirai, Tokoname, and Tetsuya Koide, Nagoya, all of Japan, assignors to Ina Seito Co., Ltd., Tokoname, Japan

PCT No. PCT/JP80/00058, § 371 Date Mar. 9, 1981, § 102(e) Date Mar. 9, 1981
PCT Filed Apr. 2, 1980, Ser. No. 253,747
Int. Cl.³ C04B *7/02*
U.S. Cl. 264—60 **6 Claims**

1. A method of manufacturing a product of cement, which comprises the steps in sequence of:
adding water into a mixture of cement and an aggregate, and kneading the mixture;
molding the resulting kneaded mixture into a desired shape;
preliminarily hardening the resulting molded body by hydration;
burning the entire body thus preliminarily hardened at a temperature of about 650° to about 950° C. to initially decrease the mechanical strength thereof;
hardening the burned body by subjecting said body to further hydration by application of water thereto so as to enhance the mechanical strength thereof.

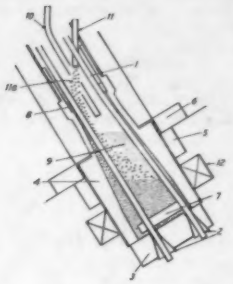
4,407,770

CABLE ANCHORAGE

Luis Ripoll, Barcelona, Spain, assignor to Stronghold International AG, Vaduz, Liechtenstein

Filed Mar. 19, 1982, Ser. No. 359,832
Claims priority, application United Kingdom, Mar. 25, 1981, 8109308
Int. Cl.³ B29C *25/00*; B29D *3/02*; B28B *21/60*
U.S. Cl. 264—69 **10 Claims**

1. In a method of filling a cable anchorage comprising an anchored cable element or elements and a sleeve through which the cable element or elements extend the improvement comprising the steps of at least partially filling said sleeve with a curable low-viscosity liquid, thereafter adding aggregate particles to said curable liquid within said sleeve thereby to



displace said liquid so that the liquid and the aggregate particles occupy the sleeve to the desired extent, and then effecting cure of said curable liquid to form a solid mass containing said aggregate particles and enveloping the cable element or elements.

4,407,771

BLOW LINE ADDITION OF ISOCYANATE BINDER IN FIBERBOARD MANUFACTURE

William E. Betzner, St. Petersburg; Richard K. Holtman, Largo, both of Fla., and Allen R. Hill, Laurel, Miss., assignors to The Celotex Corporation, Tampa, Fla.

Filed Apr. 26, 1982, Ser. No. 371,894
Int. Cl.³ D04H *3/16*
U.S. Cl. 264—115 **15 Claims**

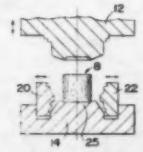
1. In a process of producing a synthetic board from cellulosic material and a binder wherein
(a) said cellulosic material is subjected to the action of steam under pressure and refined to hot and wet fibers,
(b) said hot and wet fibers are partially dewatered,
(c) said partially dewatered fibers are formed into a mat, and
(d) said mat is subjected to heat and pressure to form said synthetic board, the improvement comprising applying an organic polyisocyanate binder to said hot and wet fibers from said refining step (a).

4,407,772

METHOD OF PRODUCING A CONTOURED DISK WHEEL

Ralph A. Maglio, Wadsworth, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 128,003, Mar. 7, 1980, abandoned. This application May 28, 1982, Ser. No. 382,854
Int. Cl.³ B29C *17/00, 3/00*
U.S. Cl. 264—294 **3 Claims**



1. Method for making a contoured disk wheel comprising:
(a) spirally winding a sheet containing thermosetting resin

and randomly oriented fibers into a substantially cylindrical body, and partially curing said resin;

(b) disposing said body in end-abutting position on an elevated, substantially flat end portion of a first male mold member;

(c) moving cooperating mold members together about said first male mold member and about a lower portion of said body, said male mold member and said cooperating mold members defining at least part of a mold cavity therebetween;

(d) heating said sheet and axially moving a second male mold member toward said first male mold member, causing the partially cured resin to flow radially outwardly and axially into the said mold cavity around the periphery of said first mold member; and

(e) curing said resin to form said disk wheel.

4,407,773
NUCLEAR REACTOR INSTALLATION

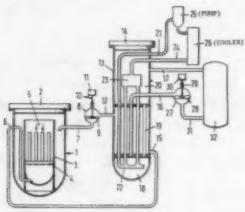
Nico Woudstra, Gouda, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands

Division of Ser. No. 905,516, May 12, 1978, Pat. No. 4,312,703. This application Oct. 8, 1981, Ser. No. 309,792

Claims priority, application Netherlands, May 13, 1977, 7705332

Int. Cl.³ G21C *15/00*

U.S. Cl. 376—299 **1 Claim**



1. A nuclear reactor installation comprising a housing containing a reactor core and provided with means for dissipating the heat generated in the reactor core during power operation, which means comprise at least one primary fluid circuit incorporating a pump and extending through the reactor core, and at least one secondary fluid circuit for heat utilization arranged outside the reactor housing to utilize the heat from said core, said secondary circuit incorporating a pump and coupled for heat transfer to said primary circuit by means of an intermediate heat exchanger; wherein said installation is provided with further means for dissipating the decay heat produced in the core of the nuclear reactor after the reactor operation has been switched off and the power shut down, said further means comprising a third circuit arranged outside the reactor housing, and said third fluid circuit being coupled to the primary circuit by said intermediate heat exchanger, said intermediate heat exchanger being structurally integrated to comprise a single vessel housing containing conducting and heat transfer members respectively forming part of the secondary circuit and the third fluid circuit and arranged at substantially the same location in the flow path of the fluid in the primary circuit so that the said primary fluid flows substantially simultaneously over the conducting members of both the secondary utilization circuit and the third decay heat fluid circuit, and wherein said intermediate integrated heat exchanger situated outside of the reactor core comprises a vessel which accommodates the external portion of the primary circuit including the primary fluid containing the heat to be dissipated from the core during the power and decay phases of reactor operation and also accommodates heat exchange portions of separate sets of circuits, one set forming a utilization circuit for absorbing the heat evolved during the power generation phase and the other set forming a decay heat circuit for absorbing the heat generated during the decay phase; each of said circuits comprising a heat-transporting fluid, a pump means, fluid distribution chambers, heat exchange tubes connected at the proximate ends of said chambers, fluid collectors connected to the distal ends of said tubes and to heat utilization or cooler means outside of the heat exchanger vessel; said tubes from each circuit set being combined into a single tube bundle in heat exchange contact with said primary fluid to remove the heat therefrom, said single tube bundle being helically wound around a set of conduit-pipes extending vertically along the axis of the vessel and terminating in said fluid distribution chambers.

4,407,774
METHOD FOR PREVENTING DANGEROUS HYDROGEN ACCUMULATION IN NUCLEAR REACTOR CONTAINMENTS

Klaus Schretzmann, Karlsruhe; Stefan Dorner, Pforzheim, and Gustav Schumacher, Karlsruhe, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe G.m.b.H., Karlsruhe, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,181

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 26331135

Int. Cl.³ G21C *9/00*

U.S. Cl. 376—300 **8 Claims**

1. In a method for the controlled removal of large amounts of suddenly released hydrogen from the containment chambers of a nuclear reactor including a water cooling system wherein, upon occurrence of an accidental break, large amounts of such hydrogen may be released which causes an increase of gas pressure in the containment and the formation of a highly explosive hydrogen-air mixture, an oxygen providing powdered material is stored within a wall structure in the containment and is, only as a result of such accident, blown out into the containment into contact with the hydrogen in a controlled manner dependent on the amount of hydrogen accidentally released such that the hydrogen is consumed with the aid of said material in a non-explosive reaction and the amount of the hydrogen in the containment is maintained below the ignition limit of a hydrogen-oxygen gas mixture.

4,407,775
PRESSURELESS CONSOLIDATION OF METALLIC POWDERS

James L. Holman, Jr.; John F. McIlwain, and L. A. Neumeier, all of Rolla, Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 258,076

Int. Cl.³ B22F *3/10*

U.S. Cl. 419—36 **5 Claims**

1. A process for pressureless consolidation of alloy powders, said alloys containing a ferrous alloy, consisting essentially of:

blending the alloy powder with about 0.25 to 1 percent of lithium tetraborate powder; and

placing the resulting admixture in an open mold, and heating in a nonoxidizing atmosphere at an elevated temperature that is below the solidus temperature of the powder for a time sufficient to effect substantial consolidation of the powder particles.

4,407,776
SHAPE MEMORY ALLOYS

Kikuo Suzuki, Suita, Japan, assignor to Sumitomo Special Metals, Ltd., Osaka, Japan

Filed Mar. 22, 1982, Ser. No. 360,566

Claims priority, application Japan, Mar. 25, 1981, 56-44580

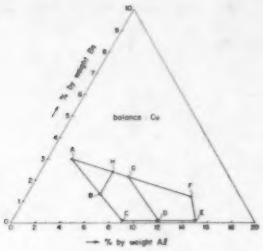
Int. Cl.³ C22C *9/01*

U.S. Cl. 420—477 **6 Claims**

1. A shape memory alloy of the beta-brass type structure consisting essentially of, by weight ratio, 2 to 15% aluminium,

0.01 to 3% beryllium and the balance being substantially copper, with impurities being inevitably present in the process of preparation, said alloy having a composition range encircled by a closed line ACEFA in FIG. 1 where, by weight ratio,

A: 2% aluminium, 3% beryllium, the balance copper;



C: 9.0% aluminium, 0.01% beryllium, the balance copper;

E: 15% aluminium, 0.01% beryllium, the balance copper; and

F: 13.5% aluminium, 1.25% beryllium, the balance copper.

4,407,777

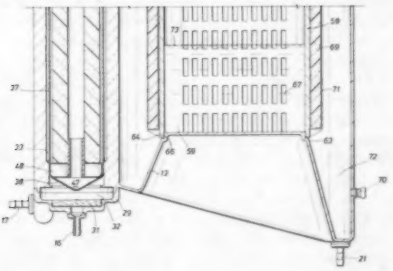
BLOOD OXYGENATOR

William R. Wilkinson, 16422 Quail Park, Missouri City, Tex. 77489, and Richard F. Wilkinson, Sr., 2114 S. Grand Ave., Santa Anna, Calif. 92705

Filed Jul. 22, 1981, Ser. No. 285,797

Int. Cl.³ A61M *1/03*

U.S. Cl. 422—46 **6 Claims**



1. A blood oxygenator comprising:

(a) a vessel molded from transparent plastics with an open-top lower container and having sealed thereto in a fluid (-) tight manner an enclosing cover;

(b) said lower container having an integral upright cylindrical wall extending substantially the height thereof;

(c) inlet means at the lower end of said cylindrical wall for directing upwardly a mixture of inflowing streams of blood and oxygen gas;

(d) said inlet means including a porous member for dispersing finely divided oxygen gas bubbles into the blood stream;

(e) said cylindrical wall carrying a plurality of inwardly directed vertical ribs;

(f) a closed bottomed metal tube slideably mounted concentrically within said cylindrical wall, and said tube having outwardly directed flutes internested with said ribs for providing a plurality of upright thin film blood and oxygen flow channels between said cylindrical wall and said tube;

(g) outlet means for removing the mixture of blood and oxygen gas from adjacent the upper end of said tube;

(h) an insulative tubular member having an axial passageway mounted concentrically within said tube in laterally spaced relationship providing an annulus therebetween;

(i) inlet means in said cover for inflowing a liquid coolant downwardly through said annulus of said tubular member;

(j) outlet means in said cover for outflowing the coolant upwardly from said axial passageway of said tubular member;

(k) a spacer supporting the lower end of said tubular member relative to the closed bottom of said tube for providing a fluid path between the inflowing and outflowing coolant;

(l) a vent bypass port in said cover between the coolant inlet and outlet means whereby said annulus about said tubular member is completely filled;

(m) an oblong mounting ring carried in the bottom of said lower container;

(n) an oblong vertical perforated wall with an open top and a bottom end seated upon said mounting ring in fluid tight relationship;

(o) said vertical perforated wall carrying a plurality of vertically elongated openings and a plurality of exterior vertical ribs between said elongated openings;

(p) an open-pore foam member surrounding said vertical perforated wall and said foam member enclosed on its side surfaces by a woven cover formed of synthetic polymeric threads;

(q) fing means sealing fluid tightly the top and bottom ends of said foam member to said vertical perforated wall;

(r) a conical inlet member with an open central portion positioned above said vertical perforated wall to receive an inflow of the blood and oxygen mixture from said outlet means associated with said metal tube; and said conical inlet member;

(s) said conical inlet member directing the blood and oxygen mixture along the interior surface of said vertical perforated wall in a downward splash free flow;

(t) an upright semicylindrical flow diverter positioned on said conical inlet member for deflecting blood and gas mixture inflow from direct straight line passage into said conical inlet member;

(u) a blood reservoir surrounding said vertical perforated wall in said vessel for receiving degassed and defoamed blood traversing said foam member through said vertical elongated openings;

(v) said blood reservoir having a fluid connection with outlet means for the outflow from said vessel of degassed and foam free blood;

(w) said vertical perforated wall at its open top and said blood reservoir having a fluid connection with outlet means for the outflow from said vessel of free oxygen gas; and

(x) said cover carrying projecting members for securely mounting the several elements (C-K) and (M-W) within said lower container.

4,407,778

FREON GAS DETECTING ELEMENT

Masayuki Shiratori, Kawasaki, and Masaki Katsura, Yososuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 18, 1981, Ser. No. 293,963

Claims priority, application Japan, Sep. 25, 1980, 55-132353; Sep. 25, 1980, 55-132354; Sep. 25, 1980, 55-132355

Int. Cl.³ G01N *27/12*

U.S. Cl. 422—90 **6 Claims**

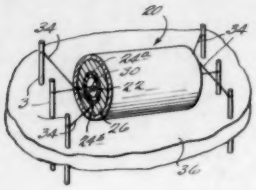
1. A freon gas detecting element comprising:

a pair of electrodes;

a gas detecting body made of metal oxide semiconductor and covering said pair of electrodes; and

a catalyst layer coated on said gas detecting body, said catalyst layer being made of V and W supported by one catalyst carrier selected from the group consisting of Al_2O_3, SiO_2,

and SiO_2-Al_2O_3, the amount of V in said catalyst layer being limited from about 0.1 wt % to about 50 wt %, and the



atomic ratio (W/V) between said V and W being limited from about 0.05 to about 0.5.

4,407,779

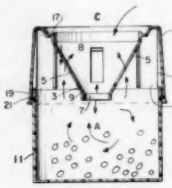
DISPERSION CONTROL DEVICE

Joseph Thompson, Upper Saddle River, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Continuation of Ser. No. 168,143, Jul. 14, 1980, abandoned. This application Jan. 13, 1982, Ser. No. 339,055

Int. Cl.³ B01D *11/02*

U.S. Cl. 422—266 **20 Claims**



12. A dispensing cap adapted to be connected to an open top of a container containing a solid to be dissolved and dispensed, said cap comprising;

an outer wall portion having a lower end adapted to be connected to an open top of a container containing a solid to be dispensed and an upper end adapted to be spaced above said lower end when said lower end is connected to the container open top;

a conical portion having an upper end and a lower end, said upper end of said conical portion being connected to said upper end of said outer wall portion with said conical portion extending downwardly and inwardly from said upper end of said outer wall portion, and said lower end of said conical portion being at a level no lower than said lower end of said outer wall portion;

said conical portion having a hole in said lower end thereof for providing permanent communication into the interior of the container when said cap is connected to the container;

said conical portion having in the wall thereof a plurality of openings providing permanent communication into the interior of the container when said cap is connected to the container; and

said hole and said openings forming means, when said cap is connected to the container and when said cap and the thus connected container are immersed in a liquid, for enabling access of the liquid through said cap into the interior of the container to dissolve a portion of the solid, and for enabling the thus formed solution of liquid and solid to be dispensed from the container through said cap and into the liquid.

4,407,780

REDUCTIVE STRIPPING OF URANIUM VALUES FROM WET-PROCESS PHOSPHORIC ACID

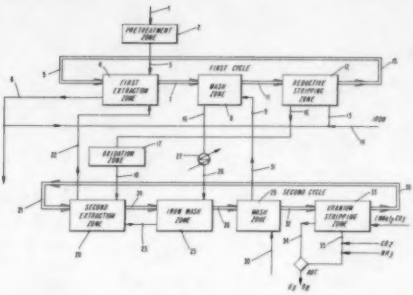
Dominique Foraison, and Alain Leveque, both of Paris, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 22, 1980, Ser. No. 152,417

Claims priority, application France, May 22, 1979, 79 12957

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **20 Claims**



1. In a process for the recovery of uranium values from a wet-process phosphoric acid solution which comprises extracting said solution with a first organic extractant, reductively stripping the resulting first organic phase of its uranium values with a strip solution including and in which ferrous ion is utilized to reduce uranyl ions in said first organic phase to uranous ions therein, disengaging the strip solution from said first organic extractant and oxidizing same to convert the uranous ions therein to uranyl ions, next extracting said oxidized strip solution and the uranium values contained therein with a second organic extractant, washing the organic phase resulting from the second extraction with an aqueous solution of phosphoric acid to strip concomitantly any iron values therefrom, and thence stripping said uranium values from the resulting second organic phase, the improvement comprising (i) washing with an iron-free aqueous wash solution, and upstream of the reductive stripping thereof, the organic phase resulting from the first extraction, and (ii) utilizing effluent, iron-free aqueous wash solution, containing phosphoric acid, from the step (i) to wash the organic phase resulting from the second extraction and concomitantly to strip any iron values therefrom, upstream of the stripping of the uranium values therefrom.

4,407,781

METHOD OF SEPARATING MOLYBDENUM FROM URANIUM

Thomas J. Crossley, Littleton, and Thomas P. Zinge, Lakewood, both of Colo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1981, Ser. No. 240,655

Int. Cl.³ C01G *43/00, 39/00*

U.S. Cl. 423—15 **7 Claims**

1. In an aqueous solution containing about 200 to about 500 ppm of uranium and about 19,000 to about 40,000 ppm molybdenum, a method of separating said molybdenum from said uranium, comprising

(A) lowering the pH of said solution to less than about 4;

(B) removing carbon dioxide from said solution;

(C) raising the pH of said solution to at least about 9 and adding, as necessary, ammonium ions to precipitate ammonium diuranate; and

(D) separating said precipitated ammonium diuranate from said solution.

4,407,782
CRYSTALLINE ZEOLITE HP

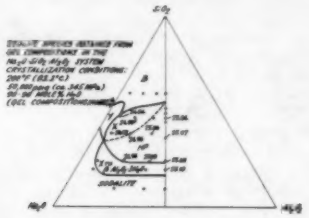
John H. Estes, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 713,457, Aug. 11, 1976, abandoned, and a continuation-in-part of Ser. No. 92,162, Nov. 7, 1979, Pat. No. 4,289,740. This application Sep. 3, 1981, Ser. No. 299,267

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—328 4 Claims



1. A synthetic crystalline sodium aluminosilicate zeolite having a lattice constant of above 24.94 A up to 25.10 A and an atom ratio of silicon to aluminum in the unit cell of below 1.00.

4,407,783
PRODUCING SILANE FROM SILICON TETRAFLUORIDE

Harry E. Ulmer, Morristown; Donald Pickens, Mendham; Forrest J. Rahl, Hackettstown, and Philip A. Lefrancois, Cranford, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 16, 1982, Ser. No. 408,408

Int. Cl.³ C01B *33/04*

U.S. Cl. 423—347 10 Claims

1. A process for producing silane which comprises reacting sodium hydride with silicon tetrafluoride in a solvent comprising a cyclic ether or dimethoxyethane having a boiling point between about 60° C. and about 110° C. in the presence of sodium aluminum hydride at a level wherein the fraction

$$\frac{\text{weight } NaAlH_4}{\text{weight } NaH + \text{weight } NaAlH_4}$$

is between about 0.04 and about 0.25.

4,407,784
PROCESS FOR THE SELECTIVE EXTRACTION TREATMENT OF GASEOUS HYDROCARBON MIXTURE CONTAINING CARBON DIOXIDE

Claude Blanc, Pau; Henry Galy, Bordes, and Jean Elgue, Vieillesegure, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Continuation of Ser. No. 230,518, Feb. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 168,797, Jul. 11, 1980, abandoned, which is a continuation of Ser. No. 87,889, Oct. 24, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,646

Claims priority, application France, Oct. 27, 1978, 78 30639

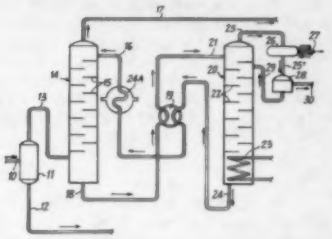
Int. Cl.³ B01D *53/34*

U.S. Cl. 423—228 5 Claims

1. A process for the treatment of a gaseous hydrocarbon mixture at a pressure from 20 to 90 bars, which mixture contains 5 to 3,000 ppm by volume of hydrogen sulfide and 0,3 to 3% carbon dioxide, in order to reduce the hydrogen sulfide content to less than 4 ppm and to limit the carbon dioxide content to 2%, wherein:

submitting the hydrocarbon mixture to a series of from 3 to 18 counter-current washings by contact with an aqueous solution of methyldiethanolamine having a concentration of 20 to 50% by weight to obtain a liquid effluent enriched in hydrogen sulfide,

submitting the enriched effluent to a regeneration treatment in a regeneration zone at a temperature and pressure to



cause the liquid effluent to boil to form a regenerated amine solution having a hydrogen sulfide content of less than 1 g/L, and returning the thus generated amine solution to the upstream end of the absorption zone, and

maintaining the flow rates of the gaseous mixture and amine solution fed to the absorption zone at such values that the ratio of the flow rate of gaseous mixture to the flow rate of the amine solution is from 16×10^3 to 25×10^3, where said flow rates are expressed in the same units.

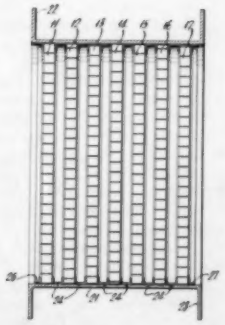
4,407,785
METHOD OF CONDUCTING CATALYTICALLY PROMOTED GAS-PHASE REACTIONS

William C. Pfefferle, Middleton, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 624,241, Oct. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 309,994, Nov. 28, 1972, abandoned. This application May 17, 1979, Ser. No. 39,925

Int. Cl.³ B01J *8/04, 12/00*

U.S. Cl. 423—659 16 Claims



1. A method for carrying out a catalytically promoted gas phase reaction comprising passing gaseous reactants through and in contact with a plurality of unobstructed parallel flow-through paths of a plurality of separate segments of honeycomb catalyst in series, discharging gaseous reaction products and unconverted reactants from each segment of said honeycomb catalyst into an unobstructed mixing zone comprising an open space between adjacent segments which is free from catalyst and packing material and having an unobstructed

cross-sectional area which, normal to the general direction of gas flow through said catalyst segments, is substantially equal to the cross-sectional area of the segment of honeycomb catalyst immediately preceding the mixing zone in the direction of gas flow, commingling the reaction products and unconverted reactants within said mixing zone, and supplying the resulting mixture of gaseous reaction products and unconverted reactants from said mixing zone to the next succeeding segment of said catalyst in the direction of gas flow, each segment of said honeycomb type catalyst being spaced from each adjacent segment by a distance at least equal to the flowthrough path channel length of the immediately upstream catalyst segment whereby the effect on the treated gases of variations in catalytic activity among the flow paths of the segments of said honeycomb-type catalyst is minimized by the commingling in said mixing zone, and discharging the resulting gaseous products of reaction from the last of said segments of honeycomb-type catalyst in the direction of gas flow.

4,407,786

GLASS COMPOSITION

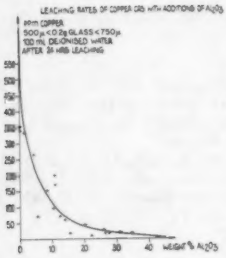
Cyril F. Drake, Harlow, and Mary Tripp, Bishop's Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Division of Ser. No. 97,019, Nov. 23, 1979. This application Apr. 9, 1981, Ser. No. 252,662

Claims priority, application United Kingdom, Dec. 21, 1978, 49600/78

Int. Cl.³ C03C *3/16;* **A61K** *33/34*

U.S. Cl. 424—14 **3 Claims**


LEACHING RATES OF COPPER OXIDE WITH ADDITIONS OF Al2O3
80m COPPER
500μ<0.2g GLASS<750μ
100 ml DEIONISED WATER
AFTER 24 HRS LEACHING
WEIGHT % Al2O3

1. A subcutaneous implant for supplying copper to the bloodstream or body fluid of an animal, the implant comprising a glass body completely soluble in the body fluid of the animal for releasing copper into solution at a predetermined uniform rate when implanted beneath the skin of the animal and leaving no residue when completely dissolved, wherein the glass body consists of cupric oxide as the source of copper, at least one alkali metal oxide as a first glass-modifying oxide, 45 to 75 mole percent phosphorous pentoxide as a glass-forming oxide present in the glass body in a predetermined concentration chosen to provide a solution with the body fluids of the animal having a pH physiologically compatible with the animal, and sufficient alumina as a second glass-modifying oxide to reduce the solubility of the glass body to the predetermined uniform rate suitable for supplementing the copper ingested by the animal from other sources to provide the total amount of copper necessary for nutrition without toxic side effects, and wherein the cupric oxide concentration is not less than 5 mole percent, said cupric oxide and alkali metal oxide concentration together is 5 to 55 mole percent, wherein the alkali metal oxide is an oxide of sodium or potassium or a combination thereof, and the alumina concentration is not more than 4 mole percent.

3. A method of supplying copper to the bloodstream of an animal with a subcutaneous implant that releases copper as it dissolves in the body fluids of the animal and leaves no residue when completely dissolved, the method comprising:

providing the glass body recited in claim **1** or **2**, wherein the composition of the glass body provides a solution with the body fluids of the animal having a pH physiologically compatible with the animal and releases copper at a uniform rate that supplements the copper ingested by the animal from other sources to provide the total amount of copper necessary for proper nutrition without toxic side effects; and

implanting said glass body beneath the skin of the animal.

4,407,787

COLLAGENOUS DRESSING

Axel Stemberger, Neubiberg, Fed. Rep. of Germany, assignor to Dr. Ruhland Nachf. GmbH, Neustadt, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 303,851

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037513

Int. Cl.³ A61F *13/00;* **C08L** *89/00;* **A61K** *35/14, 37/00*

U.S. Cl. 424—28 **12 Claims**

1. A tissue-adherent collagenous dressing, comprising collagen present in combination with a resorbable biopolymer from the group consisting of fibrinogen, gelatin modified to contain reactive SH groups, collagen modified to contain reactive SH groups, and regenerated oxycellulose modified to contain reactive SH groups.

4,407,788

DENTIFRICE

Diana Kiozpeoplou, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 299,684, Sep. 8, 1981, and Ser. No. 277,774, Jun. 26, 1981, abandoned. This application Apr. 22, 1982, Ser. No. 370,660

Int. Cl.³ A61K *7/16*

U.S. Cl. 424—49 **6 Claims**

1. A dentifrice which reduces dental stain comprising about 20–80% by weight of a liquid humectant vehicle, about 5–50% by weight of a siliceous polishing material and about 0.05–5% by weight of a resinous poly(ethylene oxide), said dentifrice containing flocculated particles formed by said siliceous polishing material in the presence of said poly(ethylene oxide).

4,407,789

GROUND RICE HULLS IN BODY POWDERS

Edward Eigen, East Brunswick; Dina I. Brachman, Highland Park, and Stuart D. Friedman, Bound Brook, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,874

Int. Cl.³ A61K *7/46, 7/021, 7/32, 7/035*

U.S. Cl. 424—69 **11 Claims**

1. A highly absorbent body powder composition consisting essentially of finely ground rice hulls which pass through a 200 mesh sieve as the base powder, in amounts up to 98% by weight of the composition and from 1 up to 15% by weight of the total composition of a suitable binding agent.

4,407,790

METHOD OF CONTROLLING BLOAT USING NONIONIC SURFACTANTS

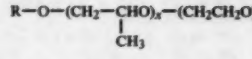
Thomas R. Oakes, Stillwater, Minn., and James L. Sadler, Cambridge, New Zealand, assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Sep. 25, 1981, Ser. No. 305,395

Int. Cl.³ A61K *31/74, 31/08*

U.S. Cl. 424—78 **10 Claims**

1. A method for the prevention or treatment of bloat in ruminants comprising the step of administering to a bloat-susceptible ruminant a bloat-controlling amount of a composition comprising nonionic surfactant of the structure



wherein R is an aliphatic, hydrophobic moiety, having about 6 to about 20 carbon atoms, x has a value of about 3 to about 40, y has a value of about 5 to 25.

4,407,791

OPHTHALMIC SOLUTIONS

Raymond L. Stark, Arlington, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Sep. 28, 1981, Ser. No. 306,317
Int. Cl.³ A61K *31/74, 31/79, 31/14*
U.S. Cl. 424—80 17 Claims

1. A method of imparting antimicrobial activity to an aqueous ophthalmic contact lens solution comprising:

adding to said solution from about 0.00001% to about 3.0% by weight/volume of α-4-[1-tris(2-hydroxyethyl) ammonium chloride-2-butenyl] poly[1-dimethyl ammonium chloride-2-butenyl]-w-tris (2-hydroxyethyl) ammonium chloride as an antimicrobial agent.

4,407,792

SUSTAINED RELEASE OPHTHALMIC DRUG DOSAGE

Ronald D. Schoenwald, and Robert E. Roehrs, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Division of Ser. No. 37,314, May 9, 1979, Pat. No. 4,271,143, which is a continuation of Ser. No. 872,074, Jan. 25, 1978, abandoned. This application Mar. 12, 1981, Ser. No. 243,266
Int. Cl.³ A61K *31/74, 31/78, 31/71, 31/35*
U.S. Cl. 424—81 29 Claims

1. An ophthalmic dosage of an aqueous gel for application to the conjunctival sac of the eye, said gel comprising an ophthalmic drug and a gel-forming high molecular weight ethylene maleic anhydride polymer, said polymer having a molecular weight in excess of 1,000,000, said ophthalmic drug being present at a level of from about 0.03 to about 15 percent by weight, said polymer being present at a level of from about 2 to about 8 percent by weight, said gel having a viscosity of from about 40,000 to about 300,000 cps and a yield value of from about 5,000 to about 20,000 dyne/cm^2.

4,407,793

COMPOSITION FOR TEMPORARY SUBSTITUTION OF BONE TISSUE DEFECTS

Alla Y. Akimova, ulitsa Kosmonavta Volkova, 7, kv. 15; Anatoly B. Davydov, ulitsa Krasny Kazanets, 19, kv. 283; Galina M. Derkach, proezd Shokalskogo, 2-a, kv. 81; Valeria I. Timokhina, Yaroslavskoe shosse, 4, korpus 4, kv. 373, all of Moscow; Sergei S. Tkachenko, Svetlanovsky prospekt, 35, kv. 16; Vladimir V. Rutsky, ulitsa Kosinova, 7, kv. 10, both of Leningrad; Mstislav V. Volkov, ulitsa Stroitelei, 6, korpus 1, kv. 63, Moscow; Irina S. Shepeleva, Bulvar generala Karbysheva, 4, kv. 15, Moscow; Alexandr V. Shiryaev, Zatsepsky val, 5, kv. 80, Moscow; Semen I. Lipkin, Leningradskoe shosse, 128, kv. 150, Moscow, and Vladimir M. Musyanovich, ulitsa 700-letia Lvova, 53, kv. 84, Lvov, all of U.S.S.R.

Filed May 26, 1982, Ser. No. 382,321
Int. Cl.³ A61K *31/78*
U.S. Cl. 424—81 7 Claims

1. A composition for a temporary substitution of bone tissue defects comprising α-cyanacrylic acid esters and a powder-like filler selected from the group consisting of a calcium salt of an organic acid and a calcium salt of an inorganic acid with a particle size of from 0.01 to 0.5 mm at the following proportions of the components, percent by weight:

α-cyanacrylic acid esters	60 to 40
powder-like filler selected from the group consisting of calcium salt of an organic acid and calcium salt of inorganic acid with a particle size of from 0.01 to 0.5 mm	40 to 60.

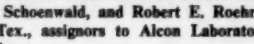
4,407,794

PEPTIDES AND THERAPEUTIC APPLICATIONS THEREOF

Bernard Roques, Saint Maurice, and Jeanne-Marie Lecomte, Paris, both of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Filed Aug. 3, 1981, Ser. No. 289,383
Claims priority, application France, Aug. 8, 1980, 80 17523
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 5 Claims

1. Peptide derivatives having the formula



(I)

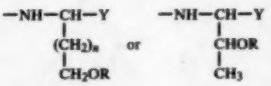
in which:

A is a D.Ser, D.Thr, D.Cys, homo Serine, βPhe Ser, βOH Leu, 4OH Ile, α,β,γ OHNor Val or OH Val residue in which the side-chain OH or SH groups may be free or protected by (i) a straight-or branched-chain alkyl radical having 1–6 carbon atoms, (ii) an unsubstituted phenyl radical or a phenyl radical substituted with one or more fluorine atoms, (iii) an unsubstituted benzyl radical or a benzyl radical substituted with one or more fluorine atoms, (iv) an aliphatic acyl radical having 1–6 carbon atoms or an acyl radical of the formula COX in which X is a phenyl, benzyl or benzhydryl radical, optionally substituted with one or more fluorine atoms,

B is a L.Phe, pF.L.Phe or pentafluoro L.Phe residue,

C is a Leu, N.Leu or Ile residue having D or L configuration,

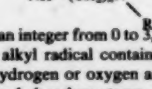
D represents a group of the formula:



in which n=B 0, 1 or 2,

R is a hydrogen atom or a radical as defined for the protection of the OH group of residue A,

Y is a hydrogen atom, a hydroxy, carboxy, carbamoyl oxy group, a group OR_1, $COOR_1$ or $CONHR_1$ in which R_1 represents a radical such as defined for the protection of the OH group of residue A, a phosphatidylethanolamine chain, or a chain



in which n is an integer from 0 to 3, R_2 is a hydrogen atom or a straight alkyl radical containing 1–4 carbon atoms, and R_3 is a hydrogen or oxygen atom or a straight alkyl residue having 1–4 carbon atoms

and their pharmaceutically acceptable salts.

4,407,795

INCLUSION COMPOUND OF P-HEXADECYLAMINO BENZOIC ACID IN CYCLODEXTRIN AND METHOD OF USE

Gabriela Nicolau, Cliffside Park, N.J., and Alfred P. Tonelli, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 16, 1981, Ser. No. 283,852
Int. Cl.³ A61K *31/73*; C08B *37/16*
U.S. Cl. 424—180 3 Claims

1. The method of inhibiting atherosclerotic occlusion of the arteries in a mammal which comprises orally administering to said mammal an effective amount of an inclusion compound comprising about 8% p-hexadecylamino benzoic acid sodium salt in β-cyclodextrin in a molar ratio of about 1:4 of said salt to β-cyclodextrin which provides enhanced bioavailability of said salt over said salt orally administered alone.

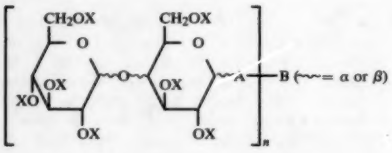
4,407,796

MODULATORS OF THE COMPLEMENT SYSTEM

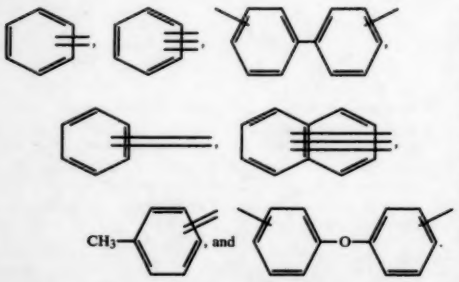
Thomas G. Miner, Sugarloaf, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,937
Int. Cl.³ A61K *31/70*; C07H *15/20, 5/10*
U.S. Cl. 424—180 28 Claims

1. A compound selected from those of the formula:



wherein X is $-SO_3M$ and M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, ammonia and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); A is selected from the group consisting of S, SO and SO_2; n is an integer 2 or 3; and B is an arylene selected from the group consisting of



10. A method of modulating the complement system in a warm-blooded animal which comprises administering to said warm-blooded animal an effective complement modulating amount of a pharmaceutically acceptable compound of claim 1.

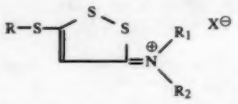
4,407,797

1,2-DITHIOL-3-YLIDENEAMMONIUM DERIVATIVES, COMPOSITIONS AND USE

Claude Cotrel, Paris; Daniel Farge, Thiais, and Gerard Taurand, Sucy-en-Brie, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Aug. 10, 1982, Ser. No. 406,980
Claims priority, application France, Aug. 11, 1981, 8115528; Jun. 17, 1982, 8210616
Int. Cl.³ A61K *31/535, 31/385*; C07D *339/04, 413/04*
U.S. Cl. 424—246 16 Claims

1. A 1,2-dithiol-3-ylideneammonium derivative of the general formula:



wherein $X^{\ominus}$ represents an pharmaceutically acceptable anion, R represents a straight- or branched-chain alkyl radical containing 1 to 7 carbon atoms [unsubstituted or substituted by a hydroxy, carboxy, alkoxycarbonyl, cyano, dialkylamino or alkylcarbonyl radical, or a benzoyl radical the phenyl ring of which is unsubstituted or substituted by one or more halogen atoms or radicals selected from alkyl (optionally substituted by one or more halogen atoms), alkoxy, hydroxy, amino, alkylamino, dialkylamino, cyano and nitro, or by a thenoyl radical the thienyl ring of which is unsubstituted or substituted by one or more halogen atoms or radicals selected from alkyl, cyano and nitro, or a pyridylcarbonyl, carbamoyl, dialkylcarbamoyl (the alkyl radicals of which can together form, with the nitrogen atom to which they are attached, a 5- or 6-membered heterocyclic ring optionally containing another heteroatom selected from oxygen, sulphur, and nitrogen substituted by an alkyl or alkylcarbonyl radical) or pyridyl radical], a dialkylcarbamoyl radical (the alkyl radicals of which can together form, with the nitrogen atom to which they are attached, a 5- or 6-membered heterocyclic ring optionally containing another heteroatom selected from oxygen, sulphur, and nitrogen substituted by an alkyl or alkycarbonyl radical), an alkenyl radical containing 2 to 4 carbon atoms, an alkynyl radical containing 2 to 4 carbon atoms, or an alkoxycarbonyl radical, or alternatively represents a 2-oxotetrahydrofuran-3-yl or 2-oxotetrahydropyran-3-yl ring, and either R_1 and R_2, which have the same or different significances, each represent a phenyl radical, a cycloalkyl radical containing 3 to 7 carbon atoms, or an alkyl or phenylalkyl radical, or alternatively together form, with the nitrogen atom to which they are attached, a 5-, 6- or 7-membered heterocylic ring which can optionally contain another hetero-atom selected from oxygen, sulphur, and nitrogen substituted by an alkyl radical, or R_1 represents a phenyl radical unsubstituted or substituted by one or more halogen atoms or radicals selected from alkyl (optionally substituted by one or more halogen atoms), alkoxy, hydroxy, amino, alkylamino, dialkylamino, cyano and nitro, or alternatively represents a cycloalkyl radical containing 3 to 7 carbon atoms, or an alkyl or phenylalkyl radical, and R_2 represents a hydrogen atom, and also the corresponding bases when R_2 represents a hydrogen atom, the aforementioned alkyl and alkoxy radicals and moieties containing 1 to 4 carbon atoms in a straight- or branched-chain unless otherwise indicated.

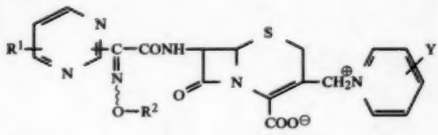
16. A method for the treatment of a patient suffering from ulceration of the digestive system which comprises administering to the patient an amount of a pharmaceutically acceptable 1,2-dithiol-3-ylideneammonium derivative conforming to the general formula depicted in claim 1 or, when R_2 represents hydrogen, a base derived thereforom, effective to ameliorate the condition of the patient.

4,407,798
CEPHEM COMPOUNDS

Takashi Kamiya, Suita; Tsutomu Teraji, Osaka; Yoshiharu Nakai, Otsu; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 26, 1981, Ser. No. 296,301
Claims priority, application United Kingdom, Aug. 29, 1980, 8028042
Int. Cl.³ C07D *501/58;* **A61K** *31/545*
U.S. Cl. 424—246 **13 Claims**

1. A compound of the formula:



in which

R^1 is amino or a protected amino group,

R^2 is cyclo(lower)alkyl, cyclo(lower)alkenyl, lower alkyl, lower alkynyl, carboxy(lower)alkyl, protected carboxy(lower)alkyl or lower alkylthio(lower)alkyl, and

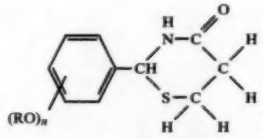
Y is hydrogen, amino or a protected amino group, and pharmaceutically acceptable salts thereof.

4,407,799
2-SUBSTITUTED-PHENYL-1,3-PERHYDROTHIAZINE-4-ONE

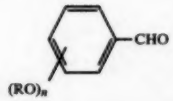
Takao Kawasaki, Sayama; Daisaku Immaru, Tama; Yoshiaki Osaka, Nagareyama; Tadashi Tsuchiya, Matsudo, and Saichi Ono, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,187
Claims priority, application Japan, Oct. 9, 1980, 55-141240
Int. Cl.³ C07D *279/06;* **A61K** *31/54*
U.S. Cl. 424—246 **4 Claims**

1. A process for preparing a compound of 2-substituted phenyl-1-1, 3-perhydrothiazine-4-one represented by the formula

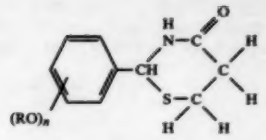


wherein R represents a lower alkyl group of 1 to 3 carbon atoms and n denotes in integer of 1 to 3, which comprises reacting an aldehyde represented by the formula



wherein R and n are as defined above, with 3-mercaptopropionic acid amide in an inert solvent.

3. A pharmaceutical anti-ulcer composition in a dosage unit form, which comprises a dosage effective for treatment of peptic ulcer of a 2-substituted phenyl-1,3-perhydrothiazine-4-one represented by the formula



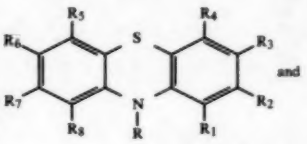
wherein R represents a lower alkyl group of 1 to 3 carbon atoms and n denotes an integer of 1 to 3, and a pharmaceutically acceptable carrier.

4,407,800
PROTOZOACIDAL ACTIVITY OF PHENOTHIAZINES

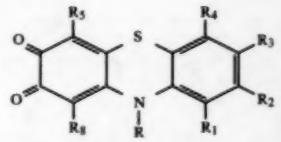
Richard D. Pearson, Charlottesville, and Erik L. Hewlett, Keswick, both of Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Nov. 2, 1981, Ser. No. 317,547
Int. Cl.³ A61K *31/54*
U.S. Cl. 424—247 **11 Claims**

1. A method of treating trypanosomiasis and leishmaniasis comprising the step of administering to a mammal having trypanosomiasis or leishmaniasis an amount effective to reduce the number of living protozoa in said mammal of a phenothiazine compound having a formula selected from the group consisting of:



and



wherein R=hydrogen, C_1–C_5 alkyl, or C_1–C_5 alkyl group substituted with an amino group or with a 5- or 6-membered heterocyclic ring containing 1 or 2 nitrogen atoms selected from the group consisting of piperazinyl, piperdyl and pyrrolidinyl and R_{1-8} independently represent hydrogen, halogen, hydroxyl, thiol, methylthiol, methylsulfinyl, C_1–C_5 alkyl, C_1–C_6 alkynoyl, phenyl, or trifluoromethyl.

4,407,801
ANTI-ISCHEMIC PHARMACEUTIC COMPOSITIONS

Jean-Claude Arnaud, La Garenne Colombes, and Michelle Devissaguet, Neuilly-sur-Seine, both of France, assignors to Science Union Et Cie, Suresnes, France

Filed Sep. 28, 1981, Ser. No. 306,224
Claims priority, application France, Sep. 30, 1980, 80 20919
Int. Cl.³ A61K *31/495, 31/70*
U.S. Cl. 424—250 **6 Claims**

3. A method for treating ischaemia in a patient which comprises administering to said patient a daily oral amount of a composition which comprises 20 to 80 mg of a compound selected from 1-(2,3,4-trimethoxybenzyl)-piperazine and a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable disintegrating agent.

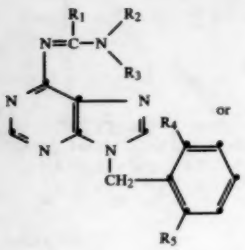
4,407,802

6-AMIDINO-9-SUBSTITUTED BENZYL PURINES

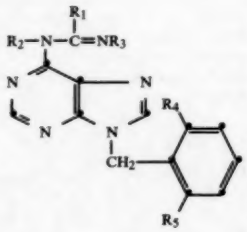
Donald W. Graham, Mountainside; Gary H. Rasmusson, Watchung, and Richard L. Tolman, Warren, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 28, 1981, Ser. No. 306,112
Int. Cl.³ C07D *473/34*; A61K *31/52*
U.S. Cl. 424—253 **6 Claims**

1. A compound having the formula



or



wherein R_1, R_2 and R_3 are independently hydrogen or loweralkyl and R_4 and R_5 are independently halogen.

5. A method for the treatment of coccidiosis in poultry which comprises administering to poultry infected with coccidiosis an effective amount of a compound of claim **1**.

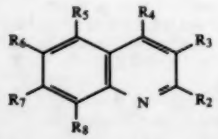
4,407,803

ANTIINFLAMMATORY 1-(QUINOLINYL)-2-PYRAZOLINE DERIVATIVES

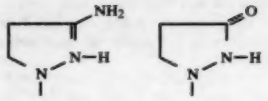
Fortuna Haviv, Dearfield, and Robert W. Denet, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,767
Int. Cl.³ A61K *31/47*; C07D *401/04*
U.S. Cl. 424—258 **38 Claims**

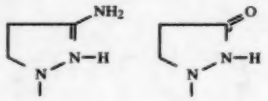
1. A compound of the formula



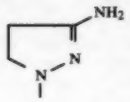
wherein R_2–R_8 independently of one another denote hydrogen, loweralkyl, phenyl, alkoxy, halo, hydroxy, nitro, trifluoromethyl,



with the proviso that at least one but no more than one of the substituents R_2–R_8 is

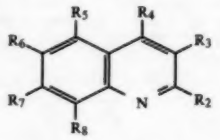


and with the further proviso that at least four of the substituents R_2–R_8 are hydrogen and, R_2 cannot be

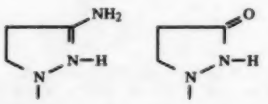


when R_3–R_8 are hydrogen, and pharmaceutically acceptable salts thereof.

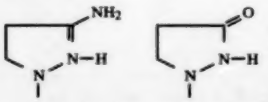
23. A method of treating or relieving the symptoms associated with inflammation comprising administering to a patient in need of such treatment a therapeutically effective amount of an antiinflammatory agent of the formula



wherein R_2–R_8 independently of one another denote hydrogen, loweralkyl, phenyl, alkoxy, halo, hydroxy, nitro, trifluoromethyl,



with the proviso that at least one but no more than one of the substituents R_2–R_8 is



and with the further proviso that at least four of the substituents R_2–R_8 are hydrogen, and pharmaceutically acceptable salts thereof.

4,407,804

ANALGESIC MIXTURE OF NALBUPHINE AND INDOMETHACIN

William K. Schmidt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1982, Ser. No. 393,805
Int. Cl.³ A61K *31/40, 31/485*
U.S. Cl. 424—260 16 Claims

1. A pharmaceutical composition comprising a combination of (a) nalbuphine, or a pharmaceutically acceptable salt thereof, and (b) indomethacin, or a pharmaceutically suitable salt thereof, in which the weight ratio of (a):(b) is from about 1:0.01 to about 1:20.

4,407,805

ANALGESIC MIXTURE OF NALBUPHINE AND ZOMEPIRAC

William K. Schmidt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1982, Ser. No. 393,808
Int. Cl.³ A61U *31/40, 31/485*
U.S. Cl. 424—260 16 Claims

1. A pharmaceutical composition comprising a combination of (a) nalbuphine, or a pharmaceutically acceptable salt thereof, and (b) zomepirac, or a pharmaceutically suitable salt thereof, in which the weight ratio of (a):(b) is from about 1:0.02 to about 1:26.

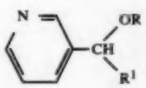
4,407,806

FUNGICIDAL, HERBICIDAL AND PLANT GROWTH REGULATING PYRIDYL-CONTAINING ETHERS

Richard E. Cherpeck, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 23, 1981, Ser. No. 323,832
Int. Cl.³ A61K *31/44;* C07D *213/16*
U.S. Cl. 424—263 16 Claims

1. A compound having the formula:



wherein

R is benzyl; benzyl substituted on the phenyl ring with 1 to 5 of the same of different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogen; or $—CH_2R^2$ wherein R^2 is lower alkenyl or lower alkenyl substituted with lower alkoxy or with 1 to 5 of the same or different halogens and;

R^1 is phenyl or phenyl substituted with 1 to 5 of the same or different substituents selected from fluoro, chloro, bromo, iodo, nitro, lower alkoxy, lower alkyl or lower alkyl substituted with 1 to 5 of the same or different halogens.

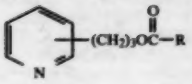
4,407,807

PYRIDYLPROPYL CYCLOALKANECARBOXYLATES: INSECT REPELLENTS

Rayman Y. Wong, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

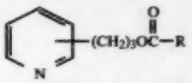
Continuation-in-part of Ser. No. 223,515, Jan. 8, 1981, abandoned. This application Dec. 21, 1981, Ser. No. 332,568
Int. Cl.³ C07D *213/55;* A01N *43/40*
U.S. Cl. 424—263 13 Claims

1. A compound having the formula



in which R is cyclobutyl.

4. A method of repelling but not killing insects selected from mosquitoes, houseflies or stable flies from a locus to be protected therefrom, comprising applying to said locus an effective insect repelling but non-lethal amount to said insects of a compound having the formula



in which R is C_3–C_5 cycloalkyl.

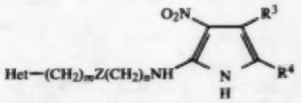
4,407,808

2-HETEROCYCLIC ALKYLAMINO-3-NITROPYRROLES

Michael L. Roantree, Welwyn Garden City, and Rodney C. Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, United Kingdom

Division of Ser. No. 159,524, Jun. 16, 1980, Pat. No. 4,331,668, which is a division of Ser. No. 43,786, May 30, 1979, Pat. No. 4,238,494. This application Jan. 28, 1982, Ser. No. 343,632
Claims priority, application United Kingdom, May 30, 1978, 24117/78; Aug. 4, 1978, 32313/78
Int. Cl.³ A61K *31/40;* C07D *403/12, 413/12;* A61K *31/41*
U.S. Cl. 424—263 5 Claims

1. A compound represented by Structure 1:



Structure 1

in which

Het is selected from the group consisting of oxazole, isoxazole and 1,2,4-triazole rings optionally substituted by lower alkyl, trifluoromethyl, hydroxymethyl, halogen, hydroxy, lower alkoxy or amino;

Z is sulphur, methylene or oxygen;

m is 0, 1 or 2 and n is 2 or 3 provided that

m+n is 3 or 4;

R^3 is hydrogen, lower alkyl, aryl, aryl lower alkyl or heteroaryl lower alkyl, aryl being phenyl optionally substituted by lower alkyl, lower alkoxy or halogen and heteroaryl being 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl or 4-pyridyl optionally substituted by lower alkyl or lower alkoxy; and

R^4 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

4. A method of blocking histamine H_2-receptors which comprises administering an effective amount of a compound of claim 1 to an animal in need of such treatment.

4,407,809
N-PHENOXY(OR THIO)HYDROCARBON 3,4,5-TRIHYDROXYPIPERIDINE DERIVATIVES, THEIR USE IN MEDICINE AND IN ANIMAL NUTRITION

Bodo Junge, Wuppertal; Jürgen Stoltefuss, Haan; Lutz Müller, Wuppertal; Hans-Peter Krause, Wuppertal, and Rüdiger Sitt, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

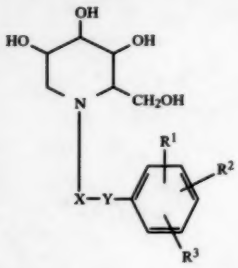
Filed Feb. 5, 1981, Ser. No. 231,695

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1980, 3007078

Int. Cl.³ A61K *31/445;* **C07D** *211/40*

U.S. Cl. 424—267 **31 Claims**

1. A 3,4,5-trihydroxypiperidine derivative of the formula



(I)

in which

X denotes a straight-chain or branched saturated or monoethylenically unsaturated hydrocarbon radical having 1 to 10 carbon atoms,

Y denotes oxygen or sulphur and R^1, R^2 and R^3 are identical or different and independently of one another denote a hydrogen or halogen atom, an alkyl, monocylic or bicyclic carbocyclic aryl or aroxy, alkylthio, nitro, hydroxyl, cyano, amino, alkylamino, dialkylamino, amioalkyl, hydroxy-alkyl, carboxylic or sulphonic acid acylamino, sulfonylamino, carboxylic or sulphonic acid acyloxy, carboxyl, carbalkoxy, alkylcarbonyl or formyl radical or a carboxamide or sulphonamide radical which is unsubstituted or substituted by C_1–C_7-alkyl or phenyl, each of said alkyl, alkoxy, alkylthio, alkylamino, aminoalkyl, hydroxyalkyl, carbalkoxy and alkylcarbonyl group having up to 12 carbon atoms; and each of said dialkylamino groups having up to 12 carbon atoms in each alkyl group.

4,407,810
THIAZOL-2-YL-OXAMIC ACID DERIVATIVES, AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Heinz Eilingsfeld, Frankenthal; Peter Neumann, Wiesloch; Guenther Seybold, Neuhofen; Dieter Lenke, Ludwigshafen, and Ludwig Friedrich, Bruehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

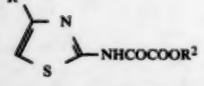
Filed Jul. 13, 1981, Ser. No. 282,661

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027527

Int. Cl.³ C07D *277/20;* **A61K** *43/78*

U.S. Cl. 424—270 **8 Claims**

1. A compound of formula I



where R^1 is phenyl which is unsubstituted or in monosubstituted or disubstituted by hydroxyl, or is monosubstituted, disubstituted or trisubstituted by methoxy or ethoxy, or is monosubstituted by methylenedioxy or ethylenedioxy and R^2 is a radical of the formula $-(CH_2CH_2O)_m-CH_2CH_2OR^3$, $-(CHR^4-CHR^5O)_n-CHR^4-CHR^5OR^3$ or $-CH_2CH_2-SR^6$ where m and n are each an integer from 0 to 3, R^3 is hydrogen or an alkyl of 1 to 4 carbon atoms, R^4 and R^5 are each hydrogen or methyl and R^6 is an alkyl of 1 to 4 carbon atoms.

4,407,811
HYPOGLYCEMIC 5-SUBSTITUTED OXAZOLIDINE-2,4-DIONES

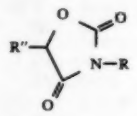
Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 222,202, Jan. 2, 1981, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,467

Int. Cl.³ A61K *31/42;* **C07D** *263/32*

U.S. Cl. 424—272 **8 Claims**

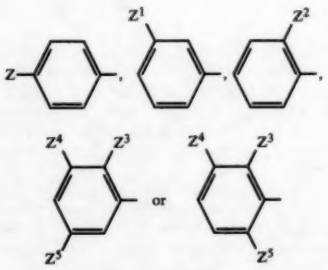
1. A method of lowering the blood glucose in a hyperglycemic mammal which comprises administering a blood glucose lowering amount of a racemic or optically active compound of the formula



wherein

R is hydrogen, (C_1–C_4))-alkanoyl, benzoyl, (C_2–C_4)-carbalkoxy, (C_1–C_3)-alkylcarbamoyl, (C_5–C_7)-cycloalkylcarbamoyl or di(C_1–C_3)-alkylcarbamoyl; and

R″ is



wherein Z is hydrogen or fluoro;

Z^1 is acetamido, amino, benzyloxy, chloro, phenoxy, nitro or trifluoromethyl;

Z^2 is acetamido, amino, benzyloxy, phenoxy, nitro or trifluoromethyl;

Z^3 is methyl, (C_1–C_2)alkoxy, methylthio, chloro or fluoro; and

Z^4 and Z^5 are each independently hydrogen, methyl, bromo, chloro, fluoro, cyano, nitro, or trifluoromethyl;

or a pharmaceutically acceptable salt thereof when R is hydrogen.

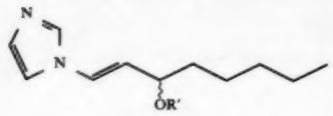
4,407,812

ETHERAL IMIDAZOLES AND USE IN TREATMENT OF THROMBOSES

Claude Bonne, Bry sur Marne; Claude Coquelet, Noisy-le-Roi, and Daniel Sincholle, St. Clement, all of France, assignors to Laboratoires Chauvin-Blache, Montpellier, France

Filed Jan. 21, 1981, Ser. No. 226,774
Claims priority, application France, Jan. 31, 1980, 80 02057
Int. Cl.³ C07D *233/54;* A61K *31/415*
U.S. Cl. 424—273 R 11 Claims

1. A compound of the formula (III):



in which R′ represents a C_{1-8} alkyl radical, an aryl radical, an aryl(C_{1-5}alkyl) or (C_{1-5}alkyl)aryl radical, the term "aryl" designating an aromatic hydrocarbon radical having 6–10 carbon atoms or a pharmaceutically acceptable acid addition salt thereof.

4,407,813

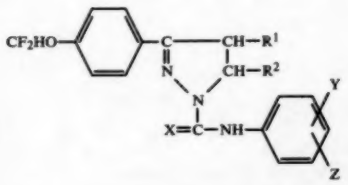
INSECTICIDAL PYRAZOLINE DERIVATIVES AND COMPOSITION

Kiyomi Ozawa; Yasuyuki Nakajima; Makoto Tsugeno; Shigeru Ishii, and Masataka Hatanaka, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,710
Claims priority, application Japan, Feb. 17, 1981, 56-21767; Jun. 19, 1981, 56-94850
Int. Cl.³ A01N *43/56;* C07D *231/06*
U.S. Cl. 424—273 P 17 Claims

1. A pyrazoline derivative having the formula

[I]



wherein R^1 represents hydrogen atom, a lower alkyl group, phenyl group or a halogen-substituted phenyl group; R^2 represents hydrogen atom or phenyl group which can have halogen substituents; X represents oxygen or sulfur atom; Y and Z respectively represent hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, nitro-group, trifluoromethyl group, a lower alkylthio group, a lower alkanoyl group, nitrile group or a lower alkyl sufonyl group.

17. An insecticidal composition which comprises an effective amount of a pyrazoline derivative defined in claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 or 16 as an active ingredient and a carrier therefor.

4,407,814

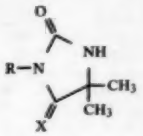
IMIDAZOLIDINE DERIVATIVES

Karl Bernauer, Oberwil; Helmut Link, Basel, and Harro Stohler, Binningen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

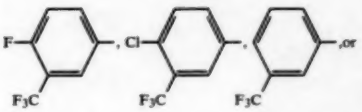
Continuation of Ser. No. 118,004, Feb. 4, 1980, abandoned, which is a continuation of Ser. No. 954,073, Oct. 24, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,364
Claims priority, application Luxembourg, Oct. 28, 1977, 78407; Switzerland, May 19, 1978, 5465; Sep. 6, 1978, 9367
The portion of the term of this patent subsequent to Nov. 18, 1997, has been disclaimed.
Int. Cl.³ C07D *233/72;* A61K *31/415*
U.S. Cl. 424—273 R 14 Claims

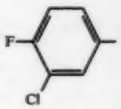
1. A compound of the formula

I



wherein X is oxygen or imino and R is





4,407,815

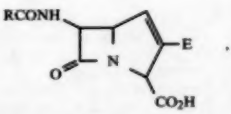
β-LACTAM ANTIBACTERIAL COMPOUNDS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Michael J. Pearson, and Clive L. Branch, both of Horsham, England, assignors to Beecham Group Limited, England

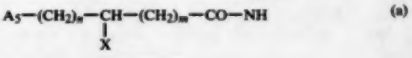
Filed Feb. 10, 1981, Ser. No. 233,180
Claims priority, application United Kingdom, Feb. 14, 1980, 8005037
Int. Cl.³ C07D *487/04;* A61K *31/40*
U.S. Cl. 424—274 103 Claims

1. A compound of the formula (II):

(II)



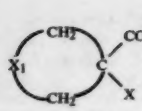
a pharmaceutically acceptable salt thereof or an ester thereof cleavable by hydrogenolysis or hydrolyzable in-vivo wherein RCONH is a group of the subformula (a), (b), (c) or (d):



(a)

(b)

-continued

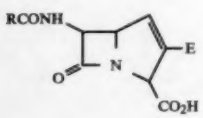


(c)

$A_6-X_2-(CH_2)_n-CO-NH$ (d)

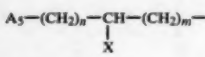
wherein n is 0, 1 or 2; m is 0, 1 or 2; A_5 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cyclohexenyl, cyclohexadienyl, phenyl, hydroxyphenyl, thienyl or pyridyl; X is hydrogen, bromo, chloro, a carboxylic acid moiety, a carboxylate ester cleavable by hydrogenolysis or hydrolyzable in-vivo, hydroxy, acyloxy, amino, ureido, guanidino or acylureido; A_6 is phenyl, 2,5-dimethoxyphenyl, 2-alkoxy-1-naphthyl, 3-arylisoxazolyl, isothiazolyl or 3-aryl-5-methylisoxazolyl wherein aryl is phenyl; X_1 is CH_2OCH_2, CH_2SCH_2 or $(CH_2)_n$ wherein n is as above defined; and X_2 is an oxygen or sulphur atom, and E is a carboxy group, a pharmaceutically acceptable salt thereof, an alkyl ester thereof wherein the alkyl moiety is of 1 to 10 carbon atoms and is unsubstituted or substituted by alkoxy of 1 to 7 carbon atoms, alkanoyloxy of 1 to 7 carbon atoms, alkenyl of up to 5 carbon atoms or alkynyl of up to 5 carbon atoms, or by 1 or 2 phenyl moieties each of which is unsubstituted or substituted by fluoro, chloro, bromo, nitro, alkyl of up to 4 carbon atoms or alkoxy of up to 4 carbon atoms, or E is cyano.

34. A pharmaceutical composition useful for treating bacterial infections in animals including humans which comprises an antibacterially effective amount of a compound of the formula (II):

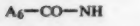


(II)

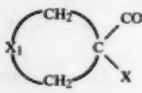
a pharmaceutically acceptable salt thereof or an ester thereof cleavable by hydrogenolysis or hydrolyzable in-vivo wherein RCONH is a group of the sub-formula (a), (b), (c) or (d):



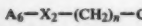
(a)



(b)



(c)



(d)

wherein n is 0, 1 or 2; m is 0, 1 or 2; A_5 is alkyl or 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, cyclohexenyl, cyclohexadienyl, phenyl, hydroxyphenyl, thienyl or pyridyl; X is hydrogen, bromo, chloro, a carboxylic acid moiety, a carboxylate ester cleavable by hydrogenolysis or hydrolyzable in-vivo, hydroxy, acyloxy, amino, ureido, guanidino or acylureido; A_6 is phenyl, 2,5-dimethoxyphenyl, 2-alkoxy-1-naphthyl, 3-arylisoxazolyl, isothiazolyl or 3-aryl-5-methylisoxazolyl wherein aryl is phenyl; X_1 is CH_2OCH_2, CH_2SCH_2 or $(CH_2)_n$ wherein n is as above defined; and X_2 is an oxygen or sulphur atom, and E is a carboxy group, a pharmaceutically acceptable salt thereof, an alkyl ester thereof wherein the alkyl moiety is of 1 to 10 carbon atoms and is unsubstituted or substituted by alkoxy of 1 to 7 carbon atoms, alkanoyloxy of 1 to 7 carbon atoms, alkenyl of up to 5 carbon atoms or alkynyl of up to 5 carbon atoms, or by 1 or 2 phenyl moieties each of which is unsubstituted or substituted by fluoro, chloro, bromo, nitro, alkyl of up to 4 carbon atoms or alkoxy of up to 4 carbon atoms, or E is cyano, in combination with a pharmaceutically acceptable carrier.

4,407,816

3-SUBSTITUTED-2-PROPENIMIDAMIDES AND METHOD OF MANUFACTURING THE SAME

Tsuyoshi Tomiyama, Sakaki, and Akira Tomiyama, Togura, both of Japan, assignors to Kotobuki Seiyaku Company Limited, Nagano, Japan

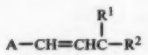
Filed Aug. 4, 1981, Ser. No. 289,903

Claims priority, application Japan, Aug. 8, 1980, 55-109060; Nov. 1, 1980, 55-154348

Int. Cl.[3] **A61K** *31/38, 31/34, 31/275, 31/165*

U.S. Cl. 424—275 **13 Claims**

1. A compound of the formula:



wherein:

A is a furyl, thienyl, phenyl, chlorophenyl or lower-alkoxyphenyl group;

R^1 represents =NCN or =$NCONH_2$ and

R^2 represents —NHR^3 or —$NHNHCOR^4$, wherein R^3 is a hydrogen atom, or a lower-alkyl, phen-lower-alkyl or cyclohexyl group, said cyclohexyl group being optionally substituted by lower-alkyl and R^4 is a lower alkyl group, and

pharmaceutically acceptable acid addition salts thereof.

4,407,817

FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO)- AND 3-(N-THIONOACYL-N-ARYLAMINO)-GAMMA-BUTYROLACTONES AND GAMMA-THIOBUTYROLACTONES

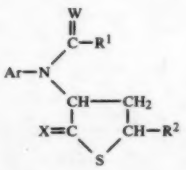
David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 228,048, Jan. 26, 1981, abandoned, Continuation of Ser. No. 44,740, Jan. 1, 1979. This application Apr. 19, 1982, Ser. No. 369,713

Int. Cl.[3] **A01N** *43/08, 43/10;* **C07D** *307/32, 333/36*

U.S. Cl. 424—275 **13 Claims**

1. A compound of the formula



(I)

wherein Ar is phenyl, naphthyl, or phenyl or naphthyl substituted with 1 to 4 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

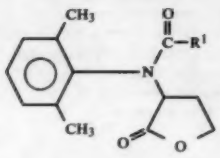
R^1 is alkenyl of 2 to 6 carbon atoms, optionally substituted by halogen or alkoxy of 1 to 4 carbon atoms, or alkenyl oxide of 2 to 6 carbon atoms;

R^2 is hydrogen, chloro, bromo, alkyl of 1 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo and alkyl of 1 to 6 carbon atoms:

W is O or S; and

X is O or S.

10. A compound selected from the group having the formula



wherein R^1 is the group having the formula $-CH{=}CH_2CH_3$ or $-CH_2CH{=}CH_3$.

4,407,818

ANTI VIRAL, ANTI BACTERIAL AND/OR ANTI FUNGAL COMPOSITION CONTAINING METAL OXYALKYLATE

Joseph E. Lionelle, and Jeffrey A. Staffa, both of Salida, Colo., assignors to Bio-Systems Research, Inc., Salida, Colo.

Continuation of Ser. No. 217,120, Dec. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 214,103, Dec. 8, 1980. This application Sep. 21, 1981, Ser. No. 304,303

Int. Cl.[3] **A61K** *31/045;* **A01N** *55/02*

U.S. Cl. 424—289 **22 Claims**

1. A therapeutic composition for treating Herpes virus comprising an effective amount of a metal oxyalkylate having the formula $M_4O(R{-}CO_2)_6$ wherein M represents zinc or manganese and R represents hydrogen or methyl, and a pharmaceutically acceptable carrier therefor.

4,407,819

PHENYLETHANOLAMINE DERIVATIVES AND ACID ADDITION SALTS THEREOF FOR THE DEPRESSION OF FAT DEPOSITION IN WARM BLOODED ANIMALS

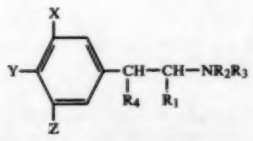
Jane A. Kiernan, Kendall Park, and Pamela K. Baker, Hopewell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 181,255, Aug. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 143,070, Apr. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 66,909, Aug. 16, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,055

Int. Cl.[3] **A61K** *31/275, 31/135, 31/42, 31/40*

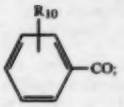
U.S. Cl. 424—304 **57 Claims**

1. A method for increasing lean meat, improving the lean meat to fat ratio, reduction of body fat and improving the efficiency of feed utilization; and/or increasing the growth rate in warm-blooded animals comprising; orally or parenterally administering to said animals an effective amount to achieve the animal body functions, above, of a compound having the general formula:

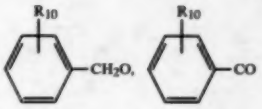


(I)

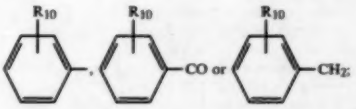
wherein X is hydrogen, halogen, or —CN; Y is hydrogen, NR_8R_9 or $NHCOR_5$; Z is halogen, OH, CF_3, CN, $COOR_1$, $CONH_2$, C_1-C_4 alkyl, C_1–C_4 alkoxy, nitro or C_1–C_4 dialkylaminomethyl; R_1 is hydrogen or C_1–C_4 alkyl; R_2 is hydrogen, methyl, ethyl, C_2–C_5 alkanoyl or



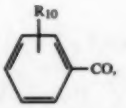
R_3 is C_1–C_5 alkyl, C_3–C_4 alkenyl, C_3–C_5 cycloalkyl, 2-hydroxyethyl, α,α-dimethylphenethyl, benzyl, 3-phenylpropyl or 3-(4-carbomethoxyphenyl)propyl; R_4 is hydrogen, OR_6 or SR_{11}; R_5 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy,



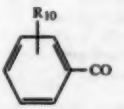
or $N(R_1)_2$; R_6 is hydrogen, C_1–C_6 alkyl, C_3–C_4 alkenyl, C_2–C_5 alkanoyl,



R_8 is hydrogen, C_1–C_4 alkyl or C_3–C_4 alkenyl; R_9 is hydrogen, C_1–C_6 alkyl, C_4–C_6 cycloalkyl, C_3–C_4 alkenyl or benzyl; R_{10} is hydrogen, chloro, dichloro, methyl, dimethyl, methoxy, dimethoxy or nitro; R_{11} is C_1–C_6 alkyl, phenyl or benzyl; and when R_8 and R_9 are taken together with the nitrogen to which they are attached, they may represent pyrrolidino; with the provisos that when R_3 is α,α-dimethylphenethyl, C_3–C_6 cycloalkyl, benzyl, 3-phenylpropyl or 3-(4-carbomethoxyphenyl)-propyl, R_2 is hydrogen, C_2–C_5 alkanoyl or benzoyl; and when R_3 is hydroxyethyl, R_2 and R_6 are hydrogen; when R_6 is C_2–C_5 alkanoyl or



R_2 and R_3 are substituents other than hydrogen, except when R_3 is an alkyl or substituted alkyl group which contains a tertiary carbon attached to nitrogen when Y is hydrogen, and X and Z are halogen, R_2 is hydrogen, C_2–C_5 alkanoyl or



and R_3 is isopropyl, 2-butyl or tert-butyl; when Z is OH, X and Y are hydrogen; when X is —CN, Z is —CN; when R_5 is $N(R_1)_2$, R_6 is hydrogen; and when R_8 is C_1–C_4 alkyl or C_3–C_4 alkenyl, R_9 is C_1–C_4 alkyl or C_3–C_4 alkenyl; or racemic mixtures of the above-identified compounds and the optically active isomers, and non-toxic, pharmacologically acceptable acid addition salts thereof.

4,407,820
DIPHENYLAMINE COMPOUNDS

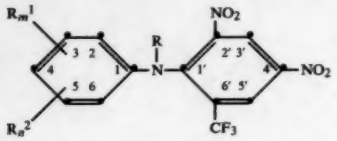
Barry A. Dreikorn, Lawrence, and Kenneth E. Kramer, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 245,424, Mar. 19, 1981, abandoned. This application Sep. 8, 1981, Ser. No. 300,160

Int. Cl.³ A01N *33/18, 37/34;* **C07C** *87/62, 121/78*

U.S. Cl. 424—304 **51 Claims**

1. Method of inhibiting a phytophagous insect or arachnid which comprises applying to a locus of the insect or arachnid an effective insect- or arachnid-inactivating amount of an active agent which is a compound of the formula



wherein

R=methyl, ethyl, or n-propyl; each R^1 is independently bromo, chloro, or fluoro;

R^2 is iodo, cyano, nitro, or trifluoromethyl;

m is an integer of from 0 to 5;

n is an integer of from 0 to 1;

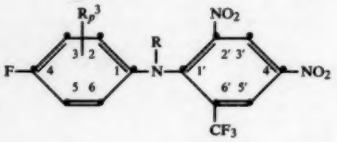
and the sum of m and n is an integer

(1) when n is 0, from 1 to 5; and

(2) when n is 1, from 1 to 3

subject to the further limitations that (1) not more than two R^1 groups represent bromo; (2) where R^2=iodo, the iodo is located at the 4-position; (3) where R^2=cyano, the cyano is located at the 3-, 4-, or 5-position; and (4) where $R^2=NO_2$, the NO_2 is located at the 2-, 3-, 5-, or 6-position.

28. Compound of the formula



wherein R is methyl, ethyl, or n-propyl; and R_p^3 is one of the following:

(1) p=0;

(2) p=1 and R^3=2-F, 3-F, 2-Cl, or 2-Br;

(3) p=2 , and R^3=2-F-6-Br or 2-F-6Cl; or

(4) p=2, 3, or 4 and each R^3=F.

4,407,821
LIPIDIC COMPOSITIONS FOR USE IN DIETETICS, REANIMATION AND THERAPEUTICS

Francois Mendy, Boulogne, France, assignor to Roussel UCLAF, Romainville, France

Filed Sep. 15, 1981, Ser. No. 302,624

Claims priority, application France, Sep. 24, 1980, 80 20477

Int. Cl.³ A61K *31/23, 31/20*

U.S. Cl. 424—312 **25 Claims**

1. A lipidic composition for use in reanimation, dietetics and in situations wherein the energy balance is endangered by a disorder of lipid digestion comprising:

(A) an oil naturally containing γ-linolenic acid, said oil enriched in γ-linolenic acid, or γ-linolenic acid, an ester of said acid, or mixtures thereof; and

(B) pure medium chain triglycerides of fatty acids containing 6 to 12 carbon atoms and comprising at least 50% by weight of the composition, wherein the ratio of the medium chain triglyceride component to the γ-linolenic component is between 10 and 100.

23. A method of compensating for a condition wherein the energy balance is endangered by a disorder of lipid digestion which comprises administering to a patient having such a condition an effective amount of the composition of claims **1, 2** or **3** to mitigate said condition.

4,407,822
BENZAMIDO-ALKYL-HYDROXAMIC ACID DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alfort, France

Filed Mar. 19, 1982, Ser. No. 360,056

Claims priority, application France, Mar. 25, 1981, 81 06017

Int. Cl.³ A61K *31/185;* **C07C** *83/10*

U.S. Cl. 424—315 **2 Claims**

1. 3-(3-aminobenzamido)-propionhydroxamic acid and its acid addition salts.

2. A therapeutical composition comprising, in association with a physiologically acceptable excipient, a pharmaceutically effective amount of a compound according to claim **1**.

4,407,823
NOVEL PHENYLACETIC ACID DERIVATIVES

Gerald Kirsch; Joachim-Friedrich Kapp, and Clemens Rufer, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

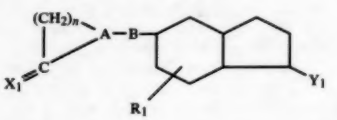
Continuation of Ser. No. 925,339, Jul. 17, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,272

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2804051; Jun. 14, 1978, 2826437

Int. Cl.³ A61K *31/19;* **C07C** *65/20*

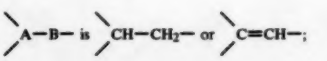
U.S. Cl. 424—317 **9 Claims**

1. A phenylacetic acid compound of the formula



wherein

n is an integer of 2 to 5;



R_1 is hydrogen, halogen, trifluoromethyl, nitro or amino;

X_1 represents two hydrogen atoms or an oxo group; and

Y_1 is carboxyl or a physiologically compatible salt thereof with a base, or ester thereof from a physiologically acceptable alcohol.

9. A method of treating inflammation in a patient in need of such treatment which comprises administering an antiinflammatorily effective amount of a compound of claim **1**.

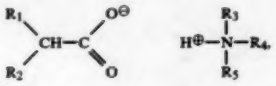
4,407,824

PHARMACEUTICAL PREPARATIONS FOR TOPICAL APPLICATION WHICH CONTAIN SALTS OF ALKANECARBOXYLIC ACIDS, NOVEL CARBOXYLIC ACID SALTS AND THE PRODUCTION THEREOF

Theodor Eckert, Münster, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

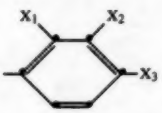
Filed Feb. 20, 1981, Ser. No. 236,097
Int. Cl.³ A61K *31/14*
U.S. Cl. 424—329 3 Claims

1. A method for the treatment of inflammatory and/or painful symptoms in warmblooded organisms which comprises topically administering to such organisms an anti-inflammatory and/or analgesic effective amount of an active compound of the formula I



(I)

wherein R_1 is a group of the formula



(IIa)

and wherein X_2 and X_3 are hydrogen; X_1 is 2,6-dichloroanilino; R_2 is hydrogen;

R_3, R_4 and R_5 are hydroxy-lower alkyl containing up to and including 4 carbon atoms, or one of R_3, R_4 and R_5 is hydrogen and the others are lower alkyl containing up to and including 4 carbon atoms, hydroxy-lower alkyl containing up to and including 4 carbon atoms, or are members of a 2-morpholinium ring, together with pharmaceutically usable conventional carriers and excipients for topical application.

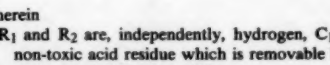
4,407,825

NOVEL BIS- AND POLY-DISULFIDES HAVING IMMUNOSTIMULANT ACTIVITY

Peter Hiestand, Allschwil, and Michael Strasser, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 29, 1982, Ser. No. 344,175
Claims priority, application United Kingdom, Feb. 5, 1981, 8103513
Int. Cl.³ A61K *31/105*; C07C *149/12*
U.S. Cl. 424—336 8 Claims

1. A compound of formula I



(I)

wherein

R_1 and R_2 are, independently, hydrogen, C_{1-5} alkyl or a non-toxic acid residue which is removable by hydrolysis under physiological conditions,

m and n are, independently, 2 or 3,

p is an integer of from 2 to 6 and

x is 1, 2 or 3,

whereby, when x is 2 or 3, each p may be the same or different.

7. A method of stimulating the immune response of a mammal in need of such treatment, which method comprises administering to said subject an amount of a compound of formula I as defined in claim 1 sufficient to effect immunostimulation.

4,407,826

METHOD OF PRODUCING KOJI PRODUCTS

Fumio Noda, Kamagaya; Kazuya Hayashi, Kashiwa; Keitaro Mogi, Noda; Takashi Iwaasa, Noda; Toshio Sakasai, Noda, and Nobuyoshi Iguchi, Noda, all of Japan, assignors to Kikkoman Shoyu Co. Ltd., Chiba, Japan

Continuation of Ser. No. 73,804, Sep. 10, 1979, abandoned. This application Sep. 17, 1981, Ser. No. 303,124
Claims priority, application Japan, Sep. 12, 1978, 53-111330
Int. Cl.³ A23L *1/20, 1/10, 1/238*
U.S. Cl. 426—7 3 Claims

1. In a method for producing a fermentation koji product which comprises inoculating a koji mold in a substrate and cultivating it, the improvement which comprises adding

(A) at least one compound selected from the group consisting of alkali metal salts of an acid selected from the group consisting of acetic acid and propionic acid, and

(B) at least one compound selected from the group consisting of hypochlorous acid, alkali metal salts of hyposulfurous acid, alkli metal hydrogen sulfite, alkali metal pyrosulfite and hydrogen peroxide,

at any time ranging from a step of preparing the substrate to the step of cultivation, the total amount of said compounds (A) and (B) being about 0.01 to about 2% by weight based on the weight of the substrate, and the weight ratio of compound (A) to compound (B) being from 1:4 to 4:1.

4,407,827

METHOD FOR THE PRODUCTION OF BREAD

Kenji Tanaka, Kawagoe, and Shigeru Endo, Tokyo, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,222
Claims priority, application Japan, Feb. 5, 1981, 56-16546
Int. Cl.³ A21D *8/02*
U.S. Cl. 426—19 4 Claims

1. In a process for producing a bread dough suitable for making bread wherein the flour is mixed with water, yeast and other additives to form a bread dough and then fermented before baking, the improvement comprising preparing the dough by adding to wheat flour a part of the required amount of water for formation of said dough and kneading the resulting mixture with pressure thereby to form an intermediate dough having the moisture content of 25–50% by weight based on the weight of the wheat flour, fermenting the intermediate dough and then kneading, said fermented intermediate dough with the remaining amount of water necessary to obtain the desired dough.

4,407,828

FERMENTATION METHOD USING A SELECTED LACTOBACILLUS

Moshe Raccach, Tempe, Ariz., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed May 29, 1981, Ser. No. 268,354
The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.
Int. Cl.³ A23L *1/31*; C12P *7/56*; C12N *1/20*; C12R *1/245*
U.S. Cl. 426—56 11 Claims

1. In a food fermentation method including the steps of providing lactic acid producing bacteria in the food with an assimilable carbohydrate and then fermenting the food with the bacteria so that lactic acid is produced from the carbohydrate over a period of time in the food the improvement which comprises:

(a) providing in admixture in a food a culture of a lactobacillus with an assimilable carbohydrate and with a stimulatory, food grade metal salt in an amount sufficient to accelerate the fermentation by the lactobacillus, wherein the culture is characterized by having low temperature fermentation characteristics in food at least as rapid as

Lactobacillus casei subspecies *alactosus* NRRL-B-12,344; and

(b) fermenting the food admixture at temperatures between about 15.6° C. and 48.9° C. so that lactic acid is produced in the food product.

4,407,829

METHOD OF MANUFACTURING COLLAGEN PRODUCTS

Einar Sjölander, Prilyckegatan 87, 425 32 Hisings-Kärra, Sweden

PCT No. PCT/SE81/00146, § 371 Date Jan. 7, 1982, § 102(e) Date Jan. 7, 1982, PCT Pub. No. WO81/03261, PCT Pub. Date Nov. 26, 1981

PCT Filed May 14, 1981, Ser. No. 339,433

Claims priority, application Sweden, May 23, 1980, 8003876

Int. Cl.³ A22C *13/00*; A23J *1/10*; C07G *7/00*

U.S. Cl. 426—59 **5 Claims**

1. A method for producing collagen fibrils from starting materials selected from animal digestive organs and slaughter biproducts comprising intestines, stomach, rumen, reticulum, third stomach, lungs and udders, comprising the steps of:

(a) cleaning the starting materials;

(b) reducing the starting materials into strips or pieces;

(c) freezing the reduced starting materials;

(d) mincing the frozen starting materials;

(e) treating the minced materials in a first slurry of water and said minced materials to which is added a proteolytic enzyme in amounts to remove proteins other than collagen and to release collagen fibrils;

(f) separating the collagen fibrils;

(g) homogenizing the collagen fibrils in a first homogenization step at a pressure of from about 50 to about 300 kgpond/cm^2;

(i) homogenizing the collagen fibrils adjusted with said acid in a second homogenization step;

(h) forming a second slurry of water and from about 1.5 to about 15% by solids content of collagen fibrils and an acid in an amount to adjust the pH to about 2.5–4.5;

(j) maturing the collagen fibrils in the second slurry for about 24 hours thereby facilitating the forming of individual fibrils; and

(k) centrifuging the collagen fibril slurry to remove air bubbles, and thereby obtain said product.

4,407,830

METHOD OF MAKING A FAT COATED MEAT PRODUCT

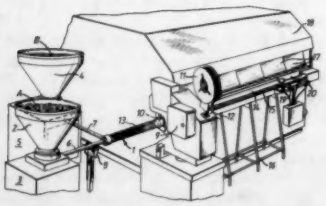
Bernard T. Matthews, Norwich; Alan J. Benstead, Aylesham; David J. Joll, Reepham; Sidney Thorp, Swanton Morley, and David N. Wilson, Hellesdon, all of England, assignors to Bernard Matthews Limited, Norfolk, England

Filed Jun. 23, 1980, Ser. No. 162,241

Claims priority, application United Kingdom, Jun. 28, 1979, 7922452

Int. Cl.³ A22C *11/00*

U.S. Cl. 426—272 **3 Claims**



1. A method of making a meat product with a relatively thin uniform outer layer of fat completely surrounding and directly contacting the meat and within which the meat is cooked, which comprises pumping relatively solid intact natural meat pieces through a central passage of an extrusion mandrel and pumping relatively fluid fatty material through a separate annular passage in said extrusion mandrel, increasing the cross-sectional area of the meat to relax the meat and reducing the thickness of the fatty material in a laterally enlarged extrusion head located at the outlet end of the extrusion mandrel, coextruding, through respective orifices in the outlet end of said extrusion head, the meat, as a core, and the fatty material, as a uniform outer annular layer completely surrounding and directly contacting the meat, directly into a flexible fitting casing to form elongated encased billets of the meat product.

4,407,831

WHEY PROTEIN FORTIFIED FISH AND PROCESS FOR PREPARATION

William E. Swartz, Upper St. Clair, Pa., assignor to Nutrisearch Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 108,432, Dec. 31, 1979, abandoned. This application Jan. 13, 1981, Ser. No. 224,718

Int. Cl.³ A23L *1/325*

U.S. Cl. 426—281 **9 Claims**

1. Protein fortified intact fish flesh, comprising intact fish flesh as the sole fish source, having incorporated into the muscle tissue of said intact fish flesh a whey protein fortifier composition having more than about 30% by weight whey protein on a dry solids basis wherein said protein fortifier composition consists essentially of about 100% of a whey protein concentrate as the sole protein source, wherein said whey protein concentrate is prepared by neutralizing whey prior to protein concentration thereof, and wherein said whey protein fortifier composition being hydratable for incorporation into said fish flesh.

4,407,832

PROCESSING OF MUSHROOMS WITH REDUCED WEIGHT LOSS

Andrew M. Ferguson, Alexandria, Va., and Howard M. Malick, West Chester, Pa., assignors to Mushroom Associates, Kennett Square, Pa.

Continuation-in-part of Ser. No. 266,222, May 11, 1981, abandoned, and a continuation-in-part of Ser. No. 46,078, Jun. 6, 1979, abandoned. This application Oct. 5, 1981, Ser. No. 308,681

Int. Cl.³ A23L *1/212*

U.S. Cl. 426—281 **14 Claims**

1. A method for processing mushrooms for reducing shrinkage during subsequent cooking comprising the steps of:

introducing the mushrooms into a sealable container whose contents include a water suspension of an effective amount of an edible microscopic sized heat stable non water soluble solid particulate hydrophilic material, with an average particle size of less than 2 microns

subjecting the contents of the container to at least one application of a pressure whose value is sufficiently above atmospheric pressure to cause compression of the air entrained between the mycellular strands of the mushrooms tissue

wherein, the pressure is at least 10 psi above atmospheric pressure, and the microscopic particulate material is at least 0.5% by weight of the suspension

submerging the mushrooms in said water suspension while rapidly restoring the pressure in the container to atmospheric pressure, at a rate rapid enough to cause a portion of the compressed air entrained between the mycellular strands to be expelled from the mushrooms

said expelled air being replaced within the mushrooms by a quantity of the water suspension, and

removing the mushrooms from the container.

8. A method for processing mushrooms with reduced shrinkage during subsequent cooking comprising the steps of:

introducing the mushrooms into a sealable container whose

contents include a water suspension of at least 0.5% by weight of an edible microscopic sized, heat stable, non water soluble, solid, particulate, hydrophilic material, with an average particle size of less than 2 microns,

subjecting the contents of the container to a vacuum of at least 20 inches of mercury, to remove a portion of the air entrained in the intermycellular spaces of the mushrooms

submerging the mushrooms in the water suspension while restoring the pressure in the container to atmospheric pressure causing a portion of the water suspension to replace the air removed from the intermycellular spaces, and

removing the mushrooms from the container.

4,407,833

WHEY PROTEIN FORTIFIED RED MEAT AND PROCESS FOR PREPARATION

William E. Swartz, Upper St. Clair, Pa., assignor to Nutrisearch Company, Cincinnati, Ohio

Continuation of Ser. No. 224,717, Jan. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 108,441, Dec. 31, 1979, abandoned. This application Sep. 10, 1982, Ser. No. 416,695

Int. Cl.³ A23L *1/31*

U.S. Cl. 426—281 **9 Claims**

1. Protein fortified red meat, comprising intact natural skeletal meat as the sole meat source, having incorporated in the muscle tissue of said red meat a whey protein fortifier composition having more than about 30% by weight whey protein on a dry solids basis wherein said whey protein fortifier composition consists essentially of from about 75% to about 100% of a whey protein concentrate as the sole protein source, wherein said whey protein concentrate is prepared by neutralizing whey prior to protein concentration thereof and wherein said whey protein fortifier composition is hydratable for incorporation into said meat.

4,407,834

RECOVERY OF XANTHINE STIMULANTS FROM AQUEOUS MEDIA

Jacky Chiovini, Daillens; Geoffrey Margolis, Bussigny, and Maurice Blanc, Morges, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 266,091, May 21, 1981, Pat. No. 4,390,698. This application Jul. 24, 1981, Ser. No. 286,632

Int. Cl.³ A23G *1/00*

U.S. Cl. 426—422 **7 Claims**

1. A process for the recovery of xanthine stimulants from an aqueous solution containing xanthine stimulants extracted from cocoa material, characterised in that the solution is contacted with a substantially neutral adsorbent and the adsorbent with the xanthine stimulants adsorbed thereon is separated from the aqueous solution having a reduced content of xanthine stimulants.

4,407,835

LEAVENING SYSTEM IN FRUCTOSE CONTAINING BAKED GOODS

Frank H. Y. Chung, Norwalk, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 6, 1981, Ser. No. 290,448

Int. Cl.³ A21D *10/04*

U.S. Cl. 426—552 **15 Claims**

1. A process for preparing chemically leavened baked goods which comprises utilizing, as the leavening acid in a bicarbonate leavening system in a cake formulation containing monosaccharide, a blend of a slow-acting phosphate leavening acid having a 2 minute donut dough rate of reaction of between about 15% and about 35% evolved CO_2 and a 10 minute donut dough rate of reaction of between about 20% and about 60% evolved CO_2 in combination with an organic acid selected from the group consisting of fumaric acid, citric acid, maleic acid, tartaric acid, succinic acid, adipic acid and mixtures thereof and baking said cake.

4,407,836

COLD WATER SOLUBLE GELATIN AND PROCESS

Peter M. Bosco, and Robert L. Danielson, both of Brookfield Center, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 22, 1982, Ser. No. 350,558

Int. Cl.³ A23L *1/04;* **A23J** *1/10, 3/00*

U.S. Cl. 426—576 **22 Claims**

1. A process for preparing a cold water soluble gelatin product comprising: preparing an aqueous solution comprising gelatin, sugar comprising a major amount of a combination of corn syrup solids having a DE of 42 or less and maltodextrin, the ratio of sugar to gelatin being in the range of from about 3:1 to about 7:1, acid and an amount of surface-active agent effective to increase dispersibility, the solution having a total solids content and a ratio of sugar to gelatin effective to form a foam; extruding the solution under conditions effective to provide foam; and drying the foam.

4,407,837

SEMOLINA DESSERT MIX

Edward J. Holley, Banbury, England, assignor to General Foods Limited, Banbury, England

Filed Mar. 15, 1982, Ser. No. 358,138

Claims priority, application United Kingdom, Mar. 16, 1981, 8108149

Int. Cl.³ A23L *1/195, 1/187*

U.S. Cl. 426—578 **5 Claims**

1. A dry semolina dessert powdered composition which comprises 15–30% of a fine hard wheat semolina, 14–30% of a powdered starch, 20–35% of pulverized sugar, 0–11% of a spray-dried skim milk powder and 15–25% of a spray-dried fat emulsion, all percentages being by weight based on the total weight of the composition.

4,407,838

FLUID NON-DAIRY COFFEE WHITENER

Charles E. Rule, Lakewood, and Donald E. Miller, Strongsville, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 251,161, Apr. 3, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,470

Int. Cl.³ A23D *5/00*

U.S. Cl. 426—602 **13 Claims**

1. A fluid, protein-free, lipoidal coffee whitener in the form of a pasteurized, homogenized, water-rich lipoidal emulsion, suitable for addition to an acidic environment, the functional ingredients of which consist essentially of

about 83.5–93.4% water;

about 6–15% edible fat;

about 0.6–1.5% mixed lipoidal emulsifier;

said fat having a Wiley Melting Point below about 120° F.;

said emulsifier constituting about 0.3–1.05% mono- and diglyceride or propylene glycol partial ester of fat-foaming acids having an HLB not substantially greater than about 5 and about 0.1–0.45% of a solid, ionizable, lipoidal, emulsifier component; said ingredients providing a viscosity similar to that of a conventional casein-containing fluid coffee whitener and less than about 20 centipoises at 40° F. as measured on a Brookfield Viscometer, Model LVF, using a No. 1 spindle at 60 RPM.

4,407,839

DUSTING BLEND

Roger Corbeil, Montreal, and Gobind Sadaranganey, Mississauga, both of Canada, assignors to Robin Hood Multifoods Inc., Ontario, Canada

Filed Jul. 6, 1981, Ser. No. 280,469
Int. Cl.³ A21D 8/10, 2/02
U.S. Cl. 426—622 19 Claims

1. An improved dusting blend for application to baking and cooking equipment and material, to prevent dough from sticking to said equipment, said dusting blend consisting essentially of a base material of flour or starch, and from 5% to 20% salt by weight sufficient to retard insect infestation while at the same time not adversely affecting fermentation of the dough.

4,407,840

INSTANT REFRIED BEAN POWDER AND PROCESS FOR PRODUCING THE SAME

Patrick J. Lathrop, Chatsworth, and Phyllis C. Rothrock, Tarzana, both of Calif., assignors to Carnation Company, Los Angeles, Calif.

Filed May 15, 1981, Ser. No. 263,850
Int. Cl.³ A23B 7/02; A23L 1/36
U.S. Cl. 426—629 10 Claims

1. A process for producing dried bean powder which is instantly reconstitutable with water to form a product having a characteristic flavor, texture and color of conventional refried beans, which comprises

blanching raw beans in hot water in an amount of from 1.25 to 2 parts by weight of water per part by weight of beans for a period of time sufficient to increase the moisture content of the beans to a minimum of about 40%,

introducing the beans and blanch water into a pressure cooker in which the beans are cooked in the blanch water at a pressure of between about 25 to 75 psi under time-temperature conditions sufficient to render the beans digestable and impart a cooked bean flavor and color to the beans,

discharging the cooked beans and water from the pressure cooker into a container which is at ambient temperature and atmospheric pressure to provide an almost instantaneous release of pressure on the cooked beans whereby the beans are physically degraded to form a bean slurry having a solids content of about 25%–35% by weight and containing finely divided bean mash, whole bean pieces and bean skin particles,

milling the bean slurry through a screen having a relatively coarse sieve opening, with minimal grinding action, so that the whole bean pieces in the slurry are reduced to a relatively small particle size while the bean skin particles are retained in the slurry, and

drying the milled bean slurry to a maximum moisture content of about 6% to thereby provide a dried bean powder containing a major proportion of finely divided cooked bean particles and an appreciable quantity of bean skin particulate, which is substantially larger in size than said cooked bean particles, said powder being instantly reconstitutable with water to form a product containing particulate matter and having the flavor, texture and color characteristics of conventional refried beans.

4,407,841

RECOVERY OF A PROTEINACEOUS OAT FRACTION FROM A DISPERSION THEREOF IN HYDROCARBON SOLVENT

John R. B. Boocock, Kingston, and Ronald E. Murray, Napanee, both of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Oct. 28, 1981, Ser. No. 315,921
Claims priority, application Canada, Nov. 6, 1980, 364117
Int. Cl.³ A23J 3/00
U.S. Cl. 426—656 10 Claims

1. A process for the recovery of a proteinaceous oat fraction from a dispersion thereof in an aliphatic hydrocarbon solvent, said hydrocarbon having 5–8 carbon atoms and said fraction containing at least 50%, by weight of the fraction, of protein, said process comprising the steps of:

(a) admixing the dispersion with at least 2.5%, by weight of the dispersion, of an aqueous ethyl alcohol solution comprising 82–92%, by weight of the solution, of ethyl alcohol and 18–8% water, with the proviso that the resultant admixture contains at least 0.35%, by weight of the admixture, of water, so as to agglomerate proteinaceous oat fraction in said dispersion;

(b) removing water from the liquid phase of the resultant admixture of agglomerated proteinaceous oat fraction in solvent so as to reduce the amount of water to less than 0.3%, by weight of the admixture; and

(c) recovering such proteinaceous oat fraction by separating the agglomerated fraction from the admixture.

4,407,842

METHOD AND COMPOSITION FOR RAPIDLY DEVELOPING LATENT FINGERPRINTS

Billy H. Shepard, 170 MarBil Rd. (P.O. Box 225), Milton, Fla. 32570

Filed Apr. 21, 1982, Ser. No. 370,382
Int. Cl.³ A61B 5/10
U.S. Cl. 427—1 17 Claims

1. The method of developing latent fingerprints on various surfaces comprising subjection of the surface on which a latent fingerprint exists to gaseous fumes produced by a mixture of cyanoacrylate ester, sulfur and sodium bicarbonate.

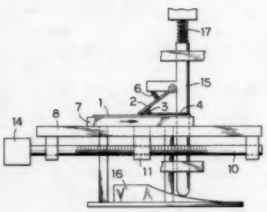
8. A composition for developing latent fingerprints on various surfaces by subjecting the surfaces and fingerprints to gaseous fumes produced by the composition, said composition comprising a mixture of cyanoacrylate ester, and a material selected from the group consisting of sodium bicarbonate, sodium carbonate and sodium chloride.

4,407,843

SMEAR SAMPLE PREPARING METHOD

Susumu Sasaki, 2-75, Shoei-cho, Mizuho-ku, Nagoya-shi, Aichi-ken, and Tomohiko Sakaki, 2-60, Ikesono-cho, Chikusa-ku, Nagoya-shi, Aichi-ken, both of Japan

Continuation of Ser. No. 92,282, Nov. 8, 1979, abandoned, which is a continuation of Ser. No. 891,766, Mar. 30, 1978, abandoned.
This application Aug. 21, 1981, Ser. No. 295,083
Claims priority, application Japan, Mar. 31, 1977, 52-36536
Int. Cl.³ B05C 11/04
U.S. Cl. 427—2 6 Claims



1. A method of preparing a smear of a nonfree flowing fluid comprising the steps of:

(1) placing a drop of the fluid on a slide;

(2) contacting the slide with a spreader at an acute angle θ to define a wedge-shaped space containing said drop;

(3) causing relative motion at a speed u between the slide and the spreader away from the drop in said space;

(4) creating a smear of said drop on said slide of substantially constant and uniform thickness over substantially the entire length of said smear; and

(5) holding said constant thickness of said smear over said length by performing at least one of the following steps (5*a*) and (5*b*) while performing step (3);

(5*a*) causing the speed u of said relative motion to increase continuously the entire time while said smear is being created; and

(5*b*) causing said angle θ to increase continuously the entire time while said smear is being created.

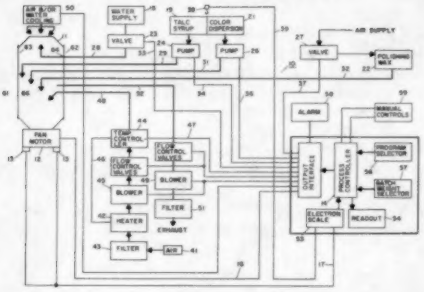
4,407,844
COATING PROCESS

Guido W. Melliger, Dover Garden Motel, Apartment 44, S. Salem St., Victory Garden, Dover, N.J. 07801, assignor to Guido W. Melliger, Dover, N.J.

Division of Ser. No. 140,469, Apr. 17, 1980, Pat. No. 4,310,562, which is a division of Ser. No. 934,519, Aug. 17, 1978, abandoned, which is a division of Ser. No. 777,468, Mar. 14, 1977, Pat. No. 4,133,290, which is a continuation-in-part of Ser. No. 672,766, Apr. 1, 1976, abandoned. This application Sep. 21, 1981, Ser. No. 304,100

Int. Cl.³ A01N *25/10*

U.S. Cl. 427—3 6 Claims



1. In a process for coating solid pharmaceutical dosage forms which comprises charging a plurality of tablets into a coating pan, rotating the pan to tumble the tablets while applying a series of coatings to the tablets, the improvement which comprises cooling the coating pan to control the deposit of coating material on the inside of the pan wall by applying a cooling medium to the external surface of the coating pan, while coating the tablets.

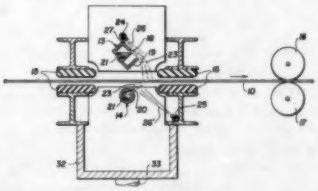
4,407,845
IONIC STRIP COATING METHOD

Edward J. Schaming, P.O. Box 1070, Butler, Pa. 16001

Division of Ser. No. 283,643, Jul. 15, 1981, Pat. No. 4,391,219. This application Jun. 17, 1982, Ser. No. 389,270

Int. Cl.³ B05D *1/04, 5/08*

U.S. Cl. 427—13 7 Claims



1. A method of coating a moving strip with lubricant or the like comprising directing streams of liquid lubricant from a body of liquid lubricant onto at least one side of a moving strip, simultaneously directing pressurized air sprays onto said streams to disperse the streams into a multitude of much finer streams substantially in a crossing pattern to thereby coat the moving strip completely and uniform, and propelling said streams toward said strip by attraction created by impressing a high voltage low current charge on said body of liquid lubricant and electrically grounding the moving strip.

4,407,846
METHOD OF PRODUCING A HYDROPHILIC MEMBRANE FROM A POLYETHYLENE BASE FILM

Sueo Machi, Takasaki; Isao Ishigaki, Maebashi; Takanobu Sugo, Gunma; Kazuo Murata; Shiro Tanso, both of Takatsuki, and Keizi Senoo, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Yuasa Battery Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 118,106, Feb. 4, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 311,032

Claims priority, application Japan, Feb. 5, 1979, 54-11983

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—35 4 Claims

1. A method of producing a hydrophylic membrane from a polyethylene base film by first irradiating the film of thickness not more than 150 μm with ionizing radiation in air or an oxygen atmosphere to give a total dose of 2 to 30 Mrad at a dose rate of 5×10^4 to 10^7 rad/sec, and then grafting without additional radiation acrylic acid and/or methacrylic acid present in the form of a 10–60 wt% aqueous solution onto the irradiated film at a temperature of 10° C. to 60° C.

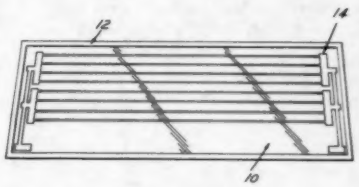
4,407,847
PROCESS FOR THE MANUFACTURE OF GLASS SHEETS

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1981, Ser. No. 335,124

Int. Cl.³ B05D *3/06, 5/12*

U.S. Cl. 427—35 9 Claims



1. A process for the manufacture of glass sheets used as windows, including the steps of:

(a) selecting a glass sheet;

(b) applying an opaque band to a surface of said glass sheet, said opaque band being formed from a radiation curable paste which includes both a filler material which can fuse to said surface of said glass sheet when heated to a fusion temperature and a radiation curable material which is heat decomposable into components which are nonreactive with said glass sheet when heated to said fusion temperature;

(c) curing said radiation curable material thereby to form a temporary bonding of said radiation curable paste to said surface of said glass sheet; and

(d) passing said glass sheet through a heating lehr which is operated at a temperature sufficiently high to heat said glass sheet to said fusion temperature whereby said fusable material of said radiation curable paste is fused to said surface of said glass sheet and whereby said radiation curable material is heat decomposed into components which are nonreactive with said surface of said glass sheet.

3. The process of claim 1, in which said radiation curable material is curable by the application of electron beam energy and said radiation curable material is cured by passing it under

an electron beam gun which applies electron beam energy thereto.

4,407,848

PROCESS FOR DURABLY MODIFYING A SHAPED SYNTHETIC POLYMER ARTICLE

Taturo Yamaguchi, Ikeda, and Norihiro Minemura, Takatsuki, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jun. 12, 1980, Ser. No. 158,731
Claims priority, application Japan, Jun. 26, 1979, 54/79613
Int. Cl.³ B05D 3/06, 3/02
U.S. Cl. 427—36 12 Claims

1. A process for durably modifying a shaped synthetic polymer article, comprising the steps of:

applying, onto at leat a peripheral surface portion of a shaped synthetic polymer article, 0.1 percent to 40 percent, based on the weight of said shaped article, of the compound diallyl phthalate then applying 0.05 percent to 20 percent, based on the weight of said shaped article, of the compound polyoxyethyleneglycolacrylate, which is capable of imparting at least one function selected from the group consisting of anti-static, perspiration-absorbing, anti-soiling, water-absorbing, moisture-absorbing, water-repellent, oil-repellent, anti-pilling, anti-snagging, anti-flaming, anti-melting, anti-bacterial, bonding property-enhancing and dyeing property-enhancing to said shaped article; and

copolymerizing said compounds in said shaped article.

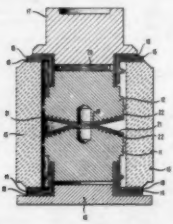
10. A process as claimed in claim 1, wherein said copolymerization of said diallyl phthalate with said polyoxyethylene glycol acrylate is initiated by applying actinic rays to the copolymerization system.

4,407,849

PROCESS FOR IMPROVING ELECTRODE COATINGS

Laird K. S. Haas, Orefield; Larry H. Herring, Nazareth, and Yoshinao Nakada, Emmaus, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1981, Ser. No. 333,974
Int. Cl.³ B05D 5/12
U.S. Cl. 427—37 9 Claims



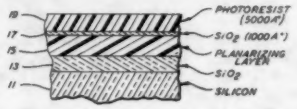
1. A method of fabricating a sealed gas surge limiter having two electrodes (11 and 12) with a coating (21) on a portion of at least one electrode and a spark gap (19) between said electrodes comprising the step of applying a pulsed signal to the electrode by means of a circuit including an AC current source (23), first means (portion I) for causing a relaxation oscillation waveform across the electrodes throughout each half-cycle of the current, second means (portion II) for producing a plurality of current spikes through the electrodes at the end of each period of the relaxation oscillation waveform and to produce a small polarity reversal each time the waveform goes to zero, and third means (portion III) for producing current spikes of high amplitude, such that a limited portion of the coating bonds with the electrode for each conduction so that said coating is bonded over essentially the entire interface with the electrode.

4,407,850

PROFILE CONTROL PHOTORESIST

Richard H. Bruce, Sandy Hook, and Alan R. Reinberg, Westport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 11, 1982, Ser. No. 338,752
Int. Cl.³ B05D 1/36, 3/04
U.S. Cl. 427—38 10 Claims



1. A method of patterning a photoresist such as to obtain a vertical wall comprising:

(a) depositing the photoresist in a thick layer on the order of one micron thick on a substrate;

(b) depositing a thin layer of silicon dioxide over said thick resist;

(c) depositing a thin layer of resist on said layer of silicon dioxide;

(d) patterning said thin resist;

(e) patterning said layer of silicon dioxide;

(f) patterning said thick photoresist with steps comprising:

(1) disposing said substrate between the plates of parallel plate reactor operating in the frequency range between 50 and 5000 KHz;

(2) supplying a reactant gas containing to said reactor for generation of a plasma containing chemically active species;

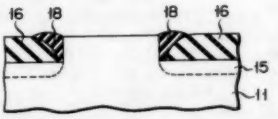
(3) establishing a pressure in said reactor in the range of 0.1 to 2 Torr.

4,407,851

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Kei Kurosawa, Tokyo, and Tadashi Shibata, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 29, 1981, Ser. No. 335,714
Claims priority, application Japan, Apr. 13, 1981, 56/55450; Jun. 10, 1981, 56/88254
Int. Cl.³ H01L 21/76
U.S. Cl. 427—39 6 Claims



1. A method for manufacturing a semiconductor device comprising the steps of:

(a) forming a masking material at a predetermined part of a surface of a semiconductor substrate, and etching said semiconductor substrate using said masking material as a mask to form a recess;

(b) applying under low pressure conditions a first insulating film on the surface of said semiconductor substrate having said masking material still disposed thereon, said first insulating film being such that the side surfaces of step portions of said recess are etched at a greater rate than other surfaces thereof;

(c) etching said first insulating film to selectively remove said first insulating film covering the side surface of said

recess to thereby reproducibly form a V-shaped groove between the side surface of said recess and said first insulating film remaining in said recess;

(d) simultaneously removing said masking material and said first insulating film formed thereover;

(e) forming a second insulating film on an upper surface of said semiconductor substrate including said V-shaped groove formed in said step (c) in such a way to form a smooth upper surface thereof; and

(f) etching the upper surface of said second insulating film to leave said first and second insulating films in said recess.

4,407,852

ELECTRETS FROM PLASMA POLYMERIZED MATERIAL

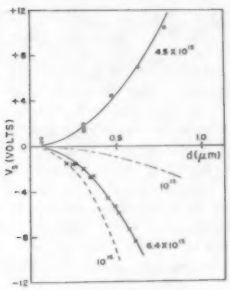
Slawomir W. Sapieha, 3380 Edouard Montpetit Blvd., Apt. 305, Montreal, Quebec, Canada, and Michael R. Wertheimer, Privada Clavel 121, Cuernavaca, Morelos, Mexico

Filed Oct. 16, 1980, Ser. No. 197,599

Claims priority, application Canada, Oct. 19, 1979, 337980

Int. Cl.³ G11C *13/02*

U.S. Cl. 427—41 **20 Claims**



1. In a device utilizing an electret, the improvement wherein the electret comprises a film of a plasma polymerized dielectric material having a substantially uniform volumetric space charge therethrough.

7. A method of manufacturing an electret comprising the steps of providing a substrate, and depositing on said substrate a plasma polymerized material.

4,407,853

PROCESS FOR PRODUCING A MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Kyoichi Naruo, both of Fujinomiya, and Goro Akashi, Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 1, 1982, Ser. No. 364,346

Claims priority, application Japan, Apr. 2, 1981, 56-49887

Int. Cl.³ H01F *10/02*; B05D *3/06*

U.S. Cl. 427—44 **3 Claims**

1. In a process for producing a magnetic recording medium by applying onto a base a magnetic coating composition comprising ferromagnetic particles dispersed in a solution comprising a compound polymerizable by electron beams and a low boiling solvent, irradiating the web with electron beams and drying the irradiated web, the improvement wherein the ferromagnetic particles are oriented while the applied magnetic coating composition is still wet and the oriented web is irradiated with electron beams within 5 seconds after orientation and dried by evaporating the solvent.

4,407,854

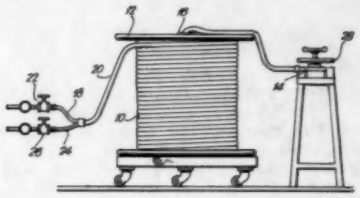
MANUFACTURE OF CABLE CORES

Ali Pan, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Mar. 24, 1981, Ser. No. 247,127

Int. Cl.³ H01B *13/16*

U.S. Cl. 427—49 **2 Claims**



1. A method of treating a stranded construction of a plurality of similar stranded together insulated conductors in a core for telecommunications cable comprising:

having the core in a reeled condition with the core having two end portions accessibly positioned outside the reel;

forming the conductors into two groups with the number of conductors in a first of the groups being substantially equal to that in the second of the groups;

disposing the groups electrically in series with one another by electrically connecting the first and second groups together at one end of the core, electrically connecting the groups at the other end of the core, one to each of two terminals of opposite potential;

heating the core with it in the reeled condition by passing an AC single phase current from said other end to said one end of the core, along the first group of conductors in one direction around the reel, into and along the second group of conductors in the opposite direction around the reel from said one end to said other end of the core, heat in the conductors flowing into the insulation to increase the temperature at the outer surface of the insulation; and periodically measuring the current and voltage applied to the conductors and from these measurements determining the resistance of the conductors to provide a measurement of the temperature of the conductors; and

unreeling the stranded construction and passing the unreeled construction through a chamber containing a flowable core filling substance, the flowability of which increases with an increase in temperature, the filling substance being caused to flow into the interstices beween the insulated conductors to fill the core, the heated core retaining a higher than ambient temperature in the filling substance to assist its flowability.

4,407,855

METHOD FOR FORMING AN ABRASION RESISTANT COATING FROM CELLULOSE ESTER AND PENTAERYTHRITOL ACRYLATES

Raymond J. Russell, Lincoln Park, N.J., assignor to Panelographic Corporation, West Caldwell, N.J.

Division of Ser. No. 104,351, Jan. 7, 1980, Pat. No. 4,308,119, which is a continuation-in-part of Ser. No. 13,418, Feb. 21, 1979, abandoned. This application Oct. 23, 1981, Ser. No. 314,129

Int. Cl.³ B05D *3/14, 3/06*

U.S. Cl. 427—54.1 **29 Claims**

1. A method for providing an abrasion resistant coating on a substrate comprising:

(a) forming a composition curable by actinic radiation consisting essentially of a pentaerythritol-based polyacrylate selected from the group consisting of a pentaerythritol polyacrylate, a pentaerythritol polymethacrylate, a dipentaerythritol polyacrylate, a dipentaerythritol polymethacrylate, a tripentaerythritol polyacrylate and a tripen-

taerythritol polymethacrylate, a cellulose ester comprising the reaction product of cellulose with at least one organic carboxylic acid having from 2 to 4 carbon atoms or nitric acid and a photoinitiator, wherein the weight ratio of said polyacrylate to said ester is from about 6 to 1 to about 100 to 1.

4,407,856

ANAEROBIC PROCESS FOR CURING RADIATION CURABLE COMPOSITIONS

Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 140,333, Apr. 14, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,417

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **9 Claims**

1. A process for anaerobic curing of a composition which comprises the steps of

(a) applying to a surface an unoxygenated radiation curable composition consisting of a monomer and a tri-functional oligomer;

(b) excluding oxygen from said composition on said surface and

(c) allowing said composition to solidify.

4,407,857

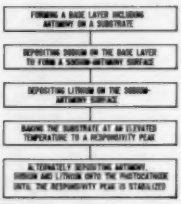
METHOD FOR PROCESSING A LITHIUM-SODIUM-ANTIMONY PHOTOCATHODE

Gilbert N. Butterwick, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 30, 1981, Ser. No. 279,182

Int. Cl.³ H01J *39/00*

U.S. Cl. 427—74 **4 Claims**


FORMING A BASE LAYER INCLUDING ANTIMONY ON A SUBSTRATE
DEPOSITING SODIUM ON THE BASE LAYER TO FORM A SODIUM-ANTIMONY SURFACE
DEPOSITING LITHIUM ON THE SODIUM-ANTIMONY SURFACE
RAISING THE SUBSTRATE AT AN ELEVATED TEMPERATURE TO A RESPONSIVITY PEAK
ALTERNATELY DEPOSITING ANTIMONY, SODIUM AND LITHIUM ONTO THE PHOTOCATHODE UNTIL THE RESPONSIVITY PEAK IS STABILIZED

1. A method of making a lithium-sodium-antimony photocathode comprising in order:

(a) forming a base layer including antimony on a substrate,

(b) depositing sodium onto said base layer such that the responsivity of the resultant sodium-antimony surface increases to a first peak value and then decreases to 90 percent of said peak value,

(c) depositing lithium onto said sodium-antimony surface until said lithium-sodium-antimony photocathode developes a hazy brown color,

(d) sensitizing said lithium-sodium-antimony photocathode until a second peak value greater than said first peak is obtained, and

(e) alternately depositing antimony, sodium and lithium onto said photocathode until said second peak is stabilized.

4,407,858

METHOD FOR PRODUCING FILMS OF SINTERED POLYCRYSTALLINE SILICON

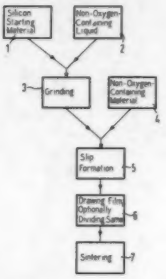
Leopold Hanke, Beyharting, Austria; Hans Hellebrand, Munich, and Helmut Schmelz, Prien, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 29, 1981, Ser. No. 335,587

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100776

Int. Cl.³ H01L *31/18*

U.S. Cl. 427—86 **5 Claims**



1. In a method of producing films of sintered polycrystalline silicon whereby relatively fine silicon particles are worked-up with additives into a slip, which is drawn-out into a film and then sintered, the improvement comprising:

grinding initial silicon material in a non-oxygen-containing liquid to an average grain size corresponding to specific surface of at least $50m^2/g$;

directly thickening the ground silicon particles and non-oxygen-containing liquid by adding a further non-oxygen-containing material so as to attain a viscosity in the resultant slip suitable for drawing a film from such slip; and

in a manner known per se, drawing a film from such slip and sintering the resultant film.

4,407,859

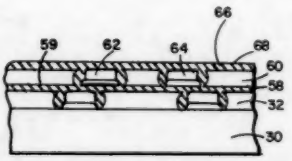
PLANAR BUBBLE MEMORY CIRCUIT FABRICATION

Addison B. Jones, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 17, 1980, Ser. No. 197,740

Int. Cl.³ B44C *1/22;* **H01L** *21/312;* **C03C** *25/00, 15/00*

U.S. Cl. 427—89 **18 Claims**



1. A method of manufacturing microcircuits having multilevel, uniformly spaced, dielectrically isolated conductor patterns on a planar substrate, which includes:

(1) forming a first insulator material layer on a planar surface of said substrate,

(2) selectively masking said first insulator material layer to define pre-configured, channel regions to be etched in said first insulator material layer,

(3) etching away said first insulator material mask defined regions to form relatively overwide channels by providing

areas of overetch in the walls of said relatively overwide channels,

(4) forming a first level conductor material pattern in aid channels with the top of said conductor material being substantially co-planar with the top surface of the channel-defining first insulator material and with said conductor material being free of contact with the overetch areas,

(5) depositing additional insulator material atop said first level conductor material and said first insulator layer backfilling said channel overetch areas with said additional insulator material, said additional insulator material defining a planar surface uniformally spaced above said substrate and thereafter,

(6) forming a second level conductor material pattern at least partially overlaying said first level conductor material pattern on said additional insulator material planar surface.

4,407,860

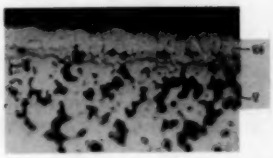
PROCESS FOR PRODUCING AN IMPROVED QUALITY ELECTROLESSLY DEPOSITED NICKEL LAYER

Rebecca P. Fleming, Fairfax, Va.; Samuel Lawhorne, Jr., Poughkeepsie, N.Y.; John J. Mele, Cornwall-on-Hudson, N.Y., and Chandrika Prasad, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 278,945

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—98 **4 Claims**



1. A process for providing a stress-free pure nickel layer on a ceramic substrate comprising

screening on said ceramic substrate selected metallized surface areas formed of a particulate paste mixture that includes a refractory metal selected from the group consisting of Mo, Ta, W and Mn and mixtures thereof, and a particulate glass material in an amount in the range of 0.5 to 15% by weight, and sintering the surface areas,

selectively depositing a layer of nickel-boron on said metallized surface areas of said substrate by electroless plating techniques, wherein said boron content is in the range of 0.1 to 3% by weight, and

heating the resultant substrate and nickel-boron layer in a non-reacting environment at a temperature of at least 750° C. for a time sufficient to diffuse the boron from the nickel-boron layer to said glass in said metallized surface areas of the substrate, leaving essentially a pure stress-free nickel layer bonded to said substrate.

4,407,861

METHOD OF MANUFACTURING A MAGNETIC RECORDING MEDIUM OF THIN METALLIC FILM TYPE

Seizo Watanabe, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,867

Claims priority, application Japan, Aug. 10, 1981, 56-125122

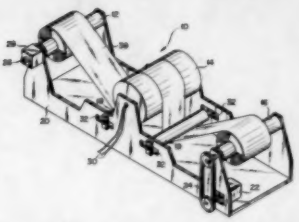
Int. Cl.³ H01F *10/02*

U.S. Cl. 427—130 **4 Claims**

1. A method of manufacturing a magnetic recording medium of thin metallic film type comprising:

a first step of forming a thin magnetic metallic film layer on a base film which heat-contracts both in a first direction and in a second direction perpendicular to the first direction; and

a second step of heating the base film, while preventing the base film from heat-contracting in the first direction and



thus heat-contracting the base film in the second direction, thereby making cracks in the thin magnetic metallic film layer which extend substantially parallel to the first direction of the base film.

4,407,862

METHOD OF MAKING LETTERPRESS PRINTING PLATES

Forrest Wessells, Deltona; Joseph Startari, Tallahasse, both of Fla., and Michael E. Estes, Marietta, Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 228,638, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 910,721, May 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,438, Mar. 31, 1978, abandoned. This application Oct. 29, 1981, Ser. No. 316,386

Int. Cl.³ B41L *7/00, 9/00*

U.S. Cl. 427—144 **4 Claims**

1. In the method for preparing a letterpress printing plate consisting essentially of positioning a substrate for receipt of a liquid light polymerizable composition, depositing said liquid light polymerizable composition on said substrate, exposing said liquid light polymerizable composition to light with a patterning means to polymerize said light polymerizable composition and form a latent relief image in said liquid light polymerizable composition and mechanically removing the unpolymerized liquid light polymerizable composition with a liquid free procedure, the improvement comprising said substrate consisting essentially of a paper laminae having a side on which the liquid light polymerizable composition is deposited and a polymeric sealing laminae sealing said side of said paper laminae on which said liquid light polymerizable composition is deposited, said paper lamina characterized by cellulosic pulp and consisting of a single sheet of smooth finish tag stock that is 5 to 20 mils thick, has a tensile strength in the press direction of at least 70 pounds per inch in width, a tensile strength in the cross press direction of at least 20 pounds per inch in width and having dark colored fibers independently colored with a dark color having a good ultraviolet light absorption/reflectivity ratio before being incorporated into said sheet.

4,407,863

PROCESS FOR PRODUCING GRANULE COATED WITH TANNIC ACID METAL CHELATE COMPOUND

Tohru Yui, Fujisawa; Hachiro Hirai, Yokohama, and Ken Takamaru, Kawasaki, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toshiba Pharmaceutical Co., Ltd., Kawasaki, both of, Japan

Filed Dec. 31, 1981, Ser. No. 336,187

Claims priority, application Japan, Jan. 14, 1981, 56-4202

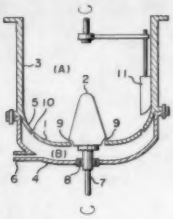
Int. Cl.³ A24D *1/06*

U.S. Cl. 427—213 **9 Claims**

1. A method for preparing a granular substrate coated with a tannic acid metal chelate compound which comprises:

granulating a non-toxic supporting substrate into granular core material; and

adding a particulate tannic acid metal chelate compound to



said granular core material while simultaneously spraying a binder solution, thereby fixedly applying a coating of said particulate tannic acid metal chelate compound on said granular core material.

4,407,864

PROCESS FOR TREATING IRON SPONGE

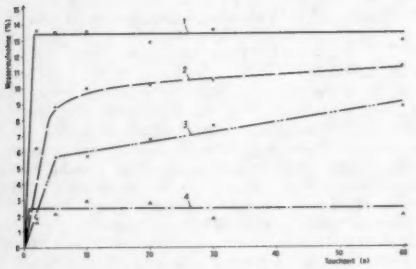
Kurt Stift; Horst Sulzbacher, both of Leoben, and Günther Saiger, Trofaiach, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Oct. 1, 1981, Ser. No. 307,577

Claims priority, application Austria, Oct. 1, 1980, 4904/80

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—216 **10 Claims**



1. Process for treating porous iron-containing particles, in particular iron sponge, for preventing reoxidation and/or corrosion on storage and transport, said process comprising rolling the iron sponge particles in calcined lime dust subsequently to the production of iron sponge and then humidifying said particles with an amount of hydrating water which is smaller than required for completely hydrating the lime, characterized in that hydrophobing additives are added to the calcined lime by adding said substances to the hydrating water.

4,407,865

PROCESS FOR COATING A STERILIZING FILTER MATERIAL WITH SILVER AND PRODUCT FORMED THEREBY

Ralph A. Nice, Dublin, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 9, 1981, Ser. No. 271,890

Int. Cl.³ B05D *7/00*

U.S. Cl. 427—217 **7 Claims**

1. The process for coating a sterilizing filter composed of a particulate material comprising the steps of:

(a) immersing the filter material in a silver compound in solution,

(b) applying a chemical reducing agent to said solution causing elemental silver to plate on the surface of said material as a thin coating,

(c) filtering and washing said material, and

(d) applying heat to said material at a sintering temperature to form a more adherent bond with said elemental silver coating.

4,407,866

PROCESS FOR COATING CHOPPED STRAND OF GLASS FIBER WITH THERMOSETTING RESIN

Tadanori Kitamura, and Nobuyuki Takao, both of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Mar. 26, 1982, Ser. No. 362,065

Claims priority, application Japan, Apr. 2, 1981, 56-49938

Int. Cl.³ B32B *7/02*

U.S. Cl. 427—221 **11 Claims**

1. A process for coating chopped strands of glass fiber with thermosetting resin which comprises dipping chopped strands of glass fiber in a solution of thermosetting resin of A-stage in a polar solvent soluble or miscible with an aqueous medium to impregnate the chopped strand with the resin solution, separating the impregnated chopped strand, stirring the impregnated chopped strand in the aqueous medium to disperse the impregnated chopped strand and to remove the solvent present in the resin solution contained in the chopped strand into the aqueous medium, separating the chopped resin coated with the desolvated resin form the aqueous medium, and drying the chopped strand.

4,407,867

APPARATUS AND A METHOD FOR THE COMPLETELY AUTOMATIC LACQUERING OF STRIP-FORM MATERIALS

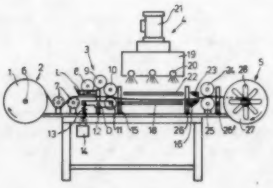
Herbert Brück; Günter H. Steinbüchel, both of Leverkusen; Hans Hofmann, Cologne; Josef Busch, Bergisch Gladbach, and Franz Hoffacker, Langenfeld, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,377

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951802

Int. Cl.³ B05D *1/28, 3/12;* B05C *1/00;* B05B *5/00*

U.S. Cl. 427—365 **10 Claims**



10. A method for automatic initiation of lacquering of strip-form materials comprising the steps of

feeding a strip of material into a lacquer application device,

inserting the leading end of the strip between a lacquer application roller and a pressure roller, said rollers being spaced apart in said application device

actuating a lacquer initiating signal with said leading end to operate means moving said rollers together and applying lacquer to said strip surface and grasping said strip between said rollers and guiding the strip to drying and curing in a drier

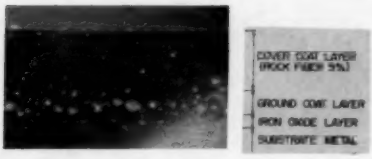
and then feeding the lacquered strip to a strip receiving spool and winding the strip in a roll on the spool.

4,407,868

PROCESS FOR THE PREPARATION OF INORGANIC FIBER CONTAINING ENAMELWARE

Yoshihiro Iizawa, Sayama, Japan, assignor to Ikebukuro Horo Kogyo Co., Ltd., Tokorozawa, Japan

Continuation of Ser. No. 220,726, Dec. 29, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,640
Claims priority, application Japan, Nov. 18, 1980, 55-161357
Int. Cl.[3] B05D *3/02*
U.S. Cl. 427—376.2 2 Claims



1. In a process for preparing enamelware which comprises preparing a slip, enameling a ware with the slip, drying the enameled ware and firing the dried ware, the improvement wherein inorganic fibers having a diameter of 5 to 30 microns and a length of 1 to 5 millimeters are added to the slip prior to enameling, and an enamel film having a thickness of 1–3 mm is produced by a single enameling step.

4,407,869

CONTROLLING BORON CONTENT OF ELECTROLESS NICKEL-BORON DEPOSITS

Glenn O. Mallory, Los Angeles, Calif., and Theresa R. Horhn, Detroit, Mich., assignors to Richardson Chemical Company, Des Plaines, Ill.

Continuation of Ser. No. 295,523, Aug. 24, 1981, abandoned. This application Dec. 13, 1982, Ser. No. 449,223
Int. Cl.[3] C23C *3/02*
U.S. Cl. 427—443.1 24 Claims

1. An electroless nickel bath for laying down a nickel-boron deposit having a relatively high percentage of boron, said bath comprising an electroless nickel bath that excludes a borohydride and that is a borane-reduced bath including:
a bath-soluble source of nickel;
a bath-soluble borane reducing agent; and
a bath-soluble boron deposition enhancing compound, said boron deposition enhancing compound being a source of ions selected from the group consisting of zirconyl ions, vanadyl ions, and combinations thereof, and said zirconyl or vanadyl ions remain substantially undeposited with the nickel-boron deposit.

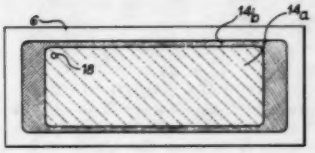
4,407,870

PROCESS FOR POSITIONING THE LIQUID MEDIUM IN A LIQUID MEDIUM CELL AND A CORRESPONDING CELL

Jean F. Clerc, Meylan, and Francoise Vinet, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed May 12, 1982, Ser. No. 377,588
Int. Cl.[3] C09K *3/34;* G02F *1/13*
U.S. Cl. 428—1 10 Claims

1. A cell comprising a liquid medium placed between two walls kept spaced from one another, the walls being joined to one another along their edge, wherein it comprises first means for producing in a first area a first surface tension force and second means for producing in a second area a second surface tension force, the first surface tension force being higher than the second surface tension force, the means for producing the different surface tension forces serving to correctly position the liquid medium between the two walls, the liquid medium



then being located at least partly in the first area and at least partly outside the second area.

4,407,871

VACUUM METALLIZED DIELECTRIC SUBSTRATES AND METHOD OF MAKING SAME

Richard C. Eisfeller, Greenland, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 133,857, Mar. 25, 1980, abandoned. This application Oct. 8, 1981, Ser. No. 309,783
Int. Cl.[3] B32B *3/10, 3/18, 5/16;* C23C *13/02*
U.S. Cl. 428—31 16 Claims

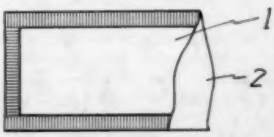
5. An automobile trim component comprising:
a. a flexible elastomeric base having a prepared surface;
b. minute discrete rounded islands consisting of a corrosion prone metal adhered to said surface, said islands appearing visually as a continuous film but being electrically isolated one from another with said film being electrically non-conductive over the surface thereof, while having a light transmission of less than 25% substantially all of said islands having an average diameter of less than 3000 A and a normal film thickness of less than 1000 A; and
c. a dielectric clear synthetic plastic top coat adhered to said surface and encapsulating and insulating said islands.

4,407,872

SHEET MATERIAL AND ENVELOPE FOR PACKAGING ELECTRONIC PARTS

Shigeo Horii, Kyoto, Japan, assignor to Ricoh Co. Ltd., Japan

Filed Dec. 2, 1981, Ser. No. 326,917
Claims priority, application Japan, Jun. 2, 1981, 56-85310; Jun. 2, 1981, 56-85311
Int. Cl.[3] B65D *27/18;* B32B *3/10, 15/08*
U.S. Cl. 428—35 14 Claims



1. An envelope for packaging electronic parts, which is

made of a laminated material comprising a transparent plastic film layer and a thin metal film layer having a light transmittance of at least 25% and electric resistance of less than 10^8 ohms/cm^2, the laminated material being heat-sealed to form said envelope with the metal film layer provided on an inner surface of the envelope.

4,407,873

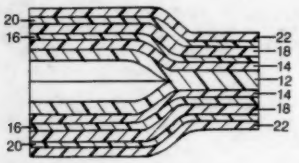
RETORTABLE PACKAGING STRUCTURE

Ronald C. Christensen, Oshkosh; Roger P. Genske; Dennis E. Kester, both of Neenah, and William F. Ossian, Appleton, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Aug. 6, 1982, Ser. No. 405,717

Int. Cl.³ B65D *85/72, 65/40, 81/18;* B32B *27/08*

U.S. Cl. 428—35 **6 Claims**



1. A laminated multiple layer flexible packaging structure, wherein the layers are firmly adhered to each other in face to face contact, the structure comprising, in order:

(a) a first layer of linear low density polyethylene;

(b) a second layer of linear low density polyethylene;

(c) a third layer of anhydride modified medium density polyethylene; and

(d) fourth, fifth and sixth layers respectively of nylon, ethylene vinyl alcohol, and nylon.

6. A pouch made from the packaging structure of claim 1, 2, 3, or 4.

4,407,874

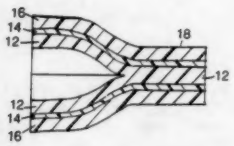
STERILIZABLE FLEXIBLE PACKAGING STRUCTURE

Russell P. Gehrke, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 6, 1982, Ser. No. 405,753

Int. Cl.³ B65D *85/72, 65/40, 81/18;* B32B *27/08*

U.S. Cl. 428—35 **8 Claims**



5. A bag, said bag comprising two facing sidewalls, said sidewalls being joined to each other by heat seals about the periphery of said pouch, said pouch being capable of maintaining strong heat seals and strong interlayer adhesions after being subjected to retort processing conditions, each said sidewall of said bag comprising a first layer disposed toward the interior of said bag and including said heat seals, said first layer comprising a propylene ethylene copolymer; a second layer adhered on one of its surfaces to said first layer and being disposed outwardly of said bag from said first layer, said second layer being a blend of 20% to 80% propylene ethylene copolymer and 80% to 20% linear low density polyethylene; and a third layer adhered to the other said surface of said second layer, said third layer comprising linear low density polyethylene.

4,407,875

TABLEWARE AND DECORATIVE ARTICLES WITH A SURFACE OF SILVER

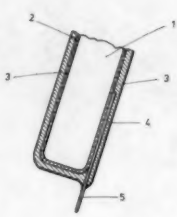
Hans Schlegel, Ulm; Theodor Nowotny, and Rolf Mayer, both of Geislingen, all of Fed. Rep. of Germany, assignors to Wurttembergische Metallwarenfabrik AG, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,563

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1980, 3022316

Int. Cl.³ B65D *5/54, 65/28*

U.S. Cl. 428—43 **9 Claims**



1. A tableware or decorative article with a surface of silver coated with a protective varnish layer of an enamel with a cellulose or synthetic resin base to prevent the article from tarnishing, wherein the article (1) has another transparent varnish coating (4) which adheres intimately to said protective varnish layer without being bonded thereto and which is removable from said protective varnish layer (3).

4,407,876

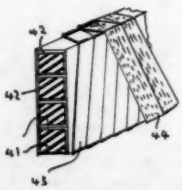
ELECTRICAL INSULATING STITCH BONDED MATERIAL

Malcolm Otty, Westering, Mill Hay Rd., Caldy, Merseyside, England

Continuation-in-part of Ser. No. 66,315, Aug. 8, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,493

Int. Cl.³ B05D *5/12*

U.S. Cl. 428—102 **9 Claims**



1. A method for electrically insulating the coils of electrical rotating machinery in which a fabric comprising high temperature fibres stitched together in the form of a stitch bonded fabric is applied to the machinery and is then impregnated with a resin which is subsequently cured so that the resin-impregnated fabric adapts to the shape of the part of the machinery to which it is applied.

4,407,877
HIGH-STRENGTH LAMINATE

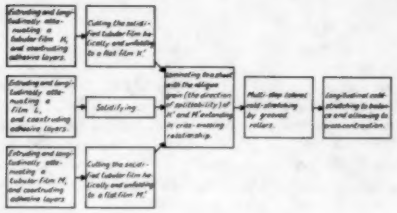
Ole-Bendt Rasmussen, 7, Topetykket, 3460 Birkeroed, Denmark

Continuation of Ser. No. 229,968, Jan. 30, 1981, abandoned, which is a continuation of Ser. No. 66,878, Aug. 16, 1979, abandoned, which is a continuation of Ser. No. 803,897, Jun. 6, 1977, abandoned, which is a division of Ser. No. 592,273, Jul. 1, 1975, Pat. No. 4,039,364. This application May 27, 1982, Ser. No. 382,724

Claims priority, application United Kingdom, Jul. 5, 1974, 29807/74; Dec. 11, 1974, 53644/74; Feb. 12, 1975, 5971/75; Feb. 12, 1975, 5972/75

Int. Cl.³ B32B 5/12

U.S. Cl. 428—105 **18 Claims**


Extruding and longitudinally attenuating a tubular film H, and constructing adhesive layers
Cutting the solidified tubular film helically and unfolding to a flat film H'
Extruding and longitudinally attenuating a tubular film L, and constructing adhesive layers
Solidifying
Laminating the sheet with the oblique grain (the direction of splittability) of H' and H' extending in criss-crossing relationship.
Multi-step biaxial cold-stretching by proved rollers
Longitudinal cold-stretching to balance and allowing to heat-contraction
Extruding and longitudinally attenuating a tubular film H, and constructing adhesive layers
Cutting the solidified tubular film helically and unfolding to a flat film H'

1. A high-strength generally continuous flexible laminate comprised of at least two generally continuous films each being biaxially oriented and generally weakly adhered to an adjacent such film in face-to-face relation, each such film being formed by extrusion with coincidental melt attenuation of a blend of at least two polymers which are sufficiently incompatible as to exhibit upon said extrusion an internal microscopic fibrillar morphology in which elongated fibrils are arranged in a generalized grain-like pattern having one predominant grain direction and imparting a corresponding direction of splittability to such film, such generalized grain pattern including fibrils having microscopically visible recurrent deflections from said predominant grain direction at intervals therealong which form a substantially zig-zagging specific grain configuration incorporated within said generalized grain pattern, the films being arranged in the laminate in such manner that the respective directions of splittability for at least two such films intersect each other.

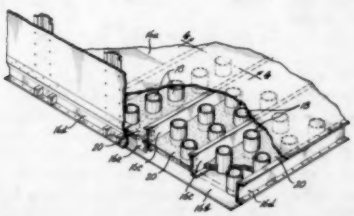
4,407,878
LOAD-BEARING HOLLOW CORE BASE PANEL

Graydon E. Smith, 13861 18th Ave. SW., Seattle, Wash. 98166, and Barry J. Lewis, 31511 41st Ave. SW., Federal Way, Wash. 98003

Filed Mar. 9, 1981, Ser. No. 242,022

Int. Cl.³ B32B 9/00

U.S. Cl. 428—119 **9 Claims**



1. A load-bearing base panel for incorporation in airfreight containers, load-bearing pallets, vehicle cargo platforms and the like, said panel being of hollow core reinforced construction comprising substantially continuous top and bottom structural sheets interconnected and maintained in parallel relationship by transversely spaced reinforcing members, and intercostal additional support means for the top and bottom sheets comprising a plurality of transversely spaced-apart compression load-bearing columns bridging between said top and bottom sheets and having opposing ends abutted but unfastened to said sheets at selected positions in at least certain of the spaces between such reinforcing members, and positioning means maintained in position by contact with a plurality of such reinforcing members and in turn maintaining the columns in spaced-apart positions in each of said spaces.

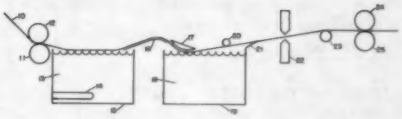
4,407,879
METHOD OF PRODUCING A TEXTURED FILM

John A. Smart, Newark, Ohio, assignor to Northern Petrochemical Company, Omaha, Nebr.

Filed Aug. 7, 1981, Ser. No. 290,860

Int. Cl.³ B32B 3/30, 27/32

U.S. Cl. 428—141 **9 Claims**



1. A method for producing a textured thermoplastic film which comprises the steps of:

(a) preparing a film from a blend or mixture of at least two compatible thermoplastics which have distinctly dissimilar softening points,

(b) orienting the film,

(c) heating the film to a temperature at or near the softening point of at least one of the thermoplastics to soften it but sufficiently below the softening point of at least one of the other thermoplastics to allow it to remain unsoftened, thereby relieving part but not all of the orientation of the film and causing the formation of protuberances in the film, said protuberances being 1/32 to ¼ inch in height, and

(d) cooling the film.

6. A textured film product comprised of at least two compatible thermoplastics which have distinctly dissimilar softening points and characterized by protuberances which are 1/32 to ¼ inches in height and spaced 1/100 to ¼ inch apart, and which number from 10 to 150 points per square inch of film surface.

4,407,880
SUBSTRATE OF MEMBER FOR RECORDING INFORMATION WITH LIGHT AND METHOD OF MANUFACTURING THE SAME

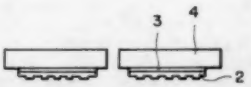
Motoyasu Terao, Hinodemachi; Shinkichi Horigome, Tachikawa; Kazuo Shigematsu, Kawasaki; Yoshinori Miyamura, Hinodemachi, and Seiji Yonezawa, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 7, 1980, Ser. No. 204,780

Claims priority, application Japan, Nov. 7, 1979, 54-153638[U]; Sep. 19, 1980, 55-129322

Int. Cl.³ B32B 5/00

U.S. Cl. 428—156 **15 Claims**



1. A method of manufacturing a substrate of a recording member, comprising the step of forming a second organic

substance layer made of a solvent-soluble organic substance on a mold to provide a second organic substance layer whose first surface, adjacent the mold, follows the contour of the mold and whose surface opposite said first surface is substantially flat, said second organic substance layer having a thickness at its thinnest part of 0.05–10 μm, said second organic substance layer being formed by depositing a stratum of the solvent-soluble organic substance on a mold and drying said stratum, said second organic substance layer being formed directly on the mold, the step of forming a first organic substance layer on said second organic substance layer, said first organic substance layer being made of an ultraviolet-curing resin of a solventless type, and of a material which is curable from its liquid state and which has a bonding property, the step of arranging a hard base on said first organic substance layer, at least one of said mold and said base being substantially transparent, the step of curing said first organic substance layer to bond said base and said second organic substance layer, said curing being carried out by irradiating said first organic substance layer with ultraviolet rays through said mold or said base, and the step of releasing said base from said mold together with said first and second organic substance layers.

4,407,881

DECORATIVE SHEETS AND PROCESSES FOR PRODUCING DECORATIVE ARTICLES BY USING THE SAME

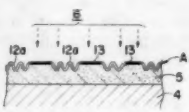
Mutsuo Shima, Tokorozawa; Kensuke Aoyama, Hatoyama, and Michiro Naka, Koganei, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,836

Claims priority, application Japan, May 30, 1981, 56-84130; Mar. 31, 1982, 57-53211

Int. Cl.³ B32B *3/00, 7/00, 31/14*

U.S. Cl. 428—156 **9 Claims**



1. A decorative sheet comprising (a) a hydrophilic deformative sheet which is susceptible to expansion deformation by swelling due to water absorption and (b) a moisture penetration controlling layer formed on the entire surface of at least one side of the hydrophilic deformative sheet, the decorative sheet having regions of different degrees of said expansion deformation caused by water absorption.

4,407,882

PRINTING INK COMPOSITIONS AND USE THEREOF FOR THE PRODUCTION OF TEXTURED FOAMED RESIN MATERIALS

Hanspeter Hauser, Aesch, and Peter Eckert, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

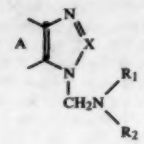
Filed Jul. 13, 1981, Ser. No. 282,573

Claims priority, application Switzerland, Jul. 15, 1980, 5413/80

Int. Cl.³ B29D *27/00;* **C09D** *11/02*

U.S. Cl. 428—159 **10 Claims**

1. A printing ink composition comprising a pigment or pigment preparation, a thermoplastic resin, water, a water-soluble organic solvent and an inhibitor for preventing the foaming of a foamable material containing a blowing agent, said inhibitor being an azole of the formula



(1)

wherein A is a benzene or naphthalene radical, X is a nitrogen atom or the

group, wherein R is a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, R_1 is an alkyl or alkenyl group, each of 1 to 20 carbon atoms, a hydroxyalkyl group of 2 to 20 carbon atoms, an alkoxyalkyl or cyanoalkyl group, each of 3 to 20 carbon atoms, a cycloalkyl group of 5 to 12 carbon atoms, or a phenalkyl group of 7 to 9 carbon atoms, R_2 has the same meaning as R_1 and can in addition be hydrogen, or R_1 and R_2, together with the nitrogen atom to which they are attached, form a heterocyclic ring.

4,407,883

LAMINATES FOR PRINTED CIRCUIT BOARDS

Thomas D. Newton, Onalaska, Wis., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 3, 1982, Ser. No. 354,311

Int. Cl.³ B32B *27/34*

U.S. Cl. 428—215 **1 Claim**

1. A laminate for use as a circuit board comprising at least one barrier material having a thickness in the range of from about 0.0005 to about 0.004 inches consisting essentially of a high temperature resistant resin selected from the group consisting of a resin based on a polyimide resin, a triazine resin, a bis-maleimide triazine resin and an epoxy resin containing a layer of a conductive metal on one surface thereof, wherein said metal is selected from the group consisting of copper, aluminum, gold and silver, and wherein said barrier material is bonded to at least one side of a core material possessing a thickness in the range of from about 0.005 to about 0.5 inches and possessing a temperature resistance that is lower than that of said barrier material and which is selected from the group consisting of a phenolic resin, an epoxy resin, an epoxy-woven glass laminate and a phenolic resin-glass laminate.

4,407,884

STAIN-RESISTANT EARTHEN ARTICLES

Alvin E. Witt, Media, Pa., assignor to PermaGrain Products, Inc., Media, Pa.

Filed Aug. 11, 1981, Ser. No. 292,018

Int. Cl.³ B32B *9/04;* **E04F** *13/08*

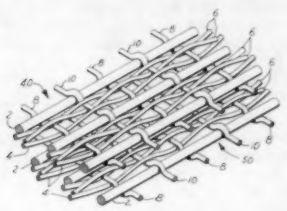
U.S. Cl. 428—220 **16 Claims**

1. A composite earthen-plastic article having improved stain resistance and strength comprising (an) a porous earthen body having a synthetic plastic polymerized in situ therein and being further impregnated with a penetrating solution comprising a drying oil or a semi-drying oil, said polymerized synthetic plastic being substantially uniformly distributed throughout the volume of said earthen body, and said drying oil or semi-drying oil also being substantially uniformly distributed throughout said earthen body whereby an article having a substantially uniform composition throughout its thickness is provided which, having its pores substantially filled with said plastic and oil, is resistant to staining.

4,407,885
COMPOSITE ARTICLE

Guy C. Murphy; Jackie D. Jones, both of Fairfield, and Charles T. Salemme, Madeira, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 28, 1981, Ser. No. 229,047
Int. Cl.³ B32B 7/00
U.S. Cl. 428—246 2 Claims



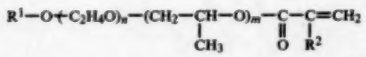
1. A substantially dry, composite fabric preform comprising:
a plurality of layers of woven fabric each including reinforcing fibrous yarn defining the fabric form and made of fibers of materials selected from the group consisting of carbon, graphite, glass, boron, silicon, refractories and their combinations;
the plurality of layers being disposed in a stacked assembly with the layers sequentially adjacent and in contact with each other;
at least each alternating of the layers in the stacked assembly including a thermoplastic fibrous material intermixed with the reinforcing fibrous material and selected from the group consisting of heat softenable polyamide polyacrylic, polyester, polyolefins, derivatives of the foregoing, and mixtures thereof;
the plurality of layers being bonded together by the thermoplastic material at junctures between the fibrous materials.

4,407,886
PRESSURE-SENSITIVE AND HEAT-SENSITIVE RECORDING MATERIAL

Dietrich Hoffman, Roedersheim-Gronau, and Holger Schöpke, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,445
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044120
Int. Cl.³ B41M 3/12; B41L 1/20
U.S. Cl. 428—320.8 12 Claims

1. A pressure-sensitive and heat-sensitive recording material comprising a carrier bearing a color-developing coating which reacts with color formers, wherein the color-developing coating consists essentially of
(a) a finely divided solid phenol-isobutyraldehyde resin of the novolac type with spherical particles of size $\leqq 5$ μm,
(b) as the dispersant, one or more copolymers containing, as copolymerized units,
(α) from 5 to 95% by weight of a copolymerizable compound of the formula



where R^1 is C_8–C_{20}-alkyl or unsubstituted or C_1–C_{20}-alkyl-substituted phenyl, R^2 is hydrogen or methyl, n is from 2 to 100 and m is from 0 to 50,
(β) from 5 to 95% by weight of a copolymerizable ethylenically unsaturated C_3–C_5-carboxylic acid or of a sulfonic acid or phosphonic acid of 2 to 5 carbon atoms carrying a polymerizable ethylenically unsaturated group, and
(γ) from 0 to 50% by weight of one or more copolymerizable ethylenically unsaturated compounds different from (α) and (β), and
(c) one or more aliphatic alcohols, which are solid at room temperature, of 12 to 18 carbon atoms,
(a) together with (b) having been applied in the form of an aqueous or aqueous-organic secondary dispersion.

4,407,887
POLYVINYLIDENE FLUORIDE FILM HAVING SUPERIOR DIELECTRIC STRENGTH AND A PROCESS FOR PRODUCING THE SAME

Hideyuki Hashizume, and Tadashi Tsuchiya, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1979, Ser. No. 24,802
Claims priority, application Japan, Mar. 31, 1978, 53-36588
Int. Cl.³ B32B 27/00, 27/36; B29C 19/02
U.S. Cl. 428—332 15 Claims

1. A polyvinylidene fluoride film having a high dielectric strength measured between a brass ball and a flat electrode of at least 10 MV/cm at room temperature and at least 8 MV/cm at 100° C.

2. A process for producing a polyvinylidene fluoride film having a high dielectric strength, which comprises laying a dielectric polymer film having a thickness of at least 1μ on one or both surfaces of a polyvinylidene fluoride film, said dielectric polymer film having a lower conductivity than the polyvinylidene fluoride film and having a dielectric strength equal to or larger than that of the polyvinylidene fluoride film; and applying an electric field of at least 10 KV/cm but less than the dielectric strength of the polyvinylidene fluoride film to these films at room temperature or higher but at a temperature lower than the temperature at which the polyvinylidene fluoride film or the dielectric polymer film thermally decompose until the dielectric strength of the polyvinylidene fluoride film measured between a brass ball and a flat electrode is at least 10 MV/cm at room temperature and at least 8 MV/cm at 100° C.

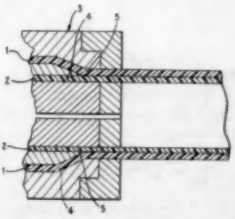
11. The polyvinylidene fluoride film of claim 1, wherein said film is prepared by the process of claim 2.

12. The polyvinylidene fluoride film of claim 11, wherein said dielectric polymer film is about 2 to 100 microns thick.

4,407,888
DIMENSIONALLY RECOVERABLE ARTICLE WITH ADHESIVE PORTION

David Crofts, Keynes, England, assignor to Raychem Limited, England

Filed Dec. 1, 1980, Ser. No. 211,803
Claims priority, application United Kingdom, Dec. 7, 1979, 7942293
Int. Cl.³ C09J 7/02; B32B 27/06
U.S. Cl. 428—355 17 Claims



1. An article which comprises a dimensionally recoverable portion formed from a material comprising a cross-linked segmented polyester-ester block copolymer, and a hot-melt

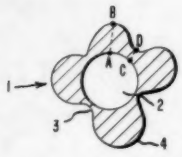
adhesive portion comprising a substantial non-cross-linked polyether-ester random copolymer derived from at least one aromatic dicarboxylic acid and at least one polymerized glycol having varying degrees of polymerization throughout the polyester, which portions are bonded together to form a single integral structure.

4,407,889

SPLITTABLE HOLLOW POLYESTER FILAMENT

Daniel Gintis, and Elmer E. Most, Jr., both of Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1982, Ser. No. 350,345
Int. Cl.³ D02G 3/00
U.S. Cl. 428—398 7 Claims



1. A polyester filament having a denier in the range of about 0.8 to about 3.35, and a centrally located continuous longitudinally extending void, said void having an area of 15 to 30% of the total cross-sectional area of the filament, including the void, when measured on a cross section cut at a right angle to the longitudinal axis of the filament, the outer surface of said filament having the form of a plurality of ridges that extend longitudinally of the filament and a plurality of grooves that extend longitudinally along the filament, and having a groove ratio in the range of about 1.7 to about 2.3, said filament having a break elongation of less than about 30%.

4,407,890

RUBBER ARTICLES, PARTICULARLY MOULDED RUBBER ARTICLES FOR USE IN SANITARY FITTINGS

Günter Buzzi, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Continuation of Ser. No. 102,503, Dec. 11, 1979, abandoned.
This application Jul. 6, 1981, Ser. No. 280,707
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854471
Int. Cl.³ B32B 9/00
U.S. Cl. 428—408 11 Claims

1. Rubber articles, particularly shaped rubber articles through which water is sprayed and on which evaporation takes place, for use in sanitary fittings, comprising a mixture of

a. 60 to 140 parts by weight of rubber,
b. 140 to 60 parts by weight of graphite,
c. 2 to 7 parts by weight of paraffin based on 200 parts by weight of rubber and graphite, and
d. an accelerating system for rubber, whereby deposition of lime deposits on the articles is substantially prevented.

4,407,891

LOW TEMPERATURE REDUCTION PROCESS FOR LARGE PHOTOMASKS

Fred M. Ernsberger, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 20, 1981, Ser. No. 323,332
Int. Cl.³ C03C 21/00
U.S. Cl. 428—410 10 Claims

1. In a method for producing a stain pattern in a glass substrate comprising the steps of injecting stain-producing cations into a surface of a glass substrate and heating the glass in the presence of a reducing agent to reduce and agglomerate the stain-producing cations to produce a stained pattern within the surface of the glass, the improvement which comprises heating the glass in a pressure vessel containing an inert liquid saturated with hydrogen under pressure.

7. An article of manufacture prepared according to the method of claim 1, wherein the roll-off region of the stained pattern edges is not more than one micron.

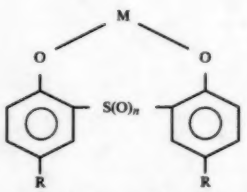
4,407,892

HEAT SENSITIVE RECORDING SHEET

Akihiro Yamaguchi, Kamakura; Keizaburo Yamaguchi, Kawasaki, and Hisamichi Murakami, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 229,562, filed as PCT JP80/00135, Jun. 18, 1979, published as WO80/02820, Dec. 24, 1980, § 102(e) dated Jan. 2, 1981, abandoned.
This application Jul. 20, 1982, Ser. No. 400,016
Claims priority, application Japan, Jun. 18, 1979, 54-75623
Int. Cl.³ B41M 5/18
U.S. Cl. 428—411 6 Claims

1. A heat sensitive recording sheet prepared by coating a developer, coupler which develops a color by a heat fusion reaction with said developer and binder, on a sheet substrate, or by impregnating such therein, characterized in that said developer is one or more than one of the compounds represented by formula (I):



(I)

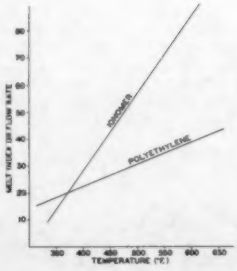
wherein each R is hydrogen, an alkyl radical of 1 to 12 carbon atoms, a cycloalkyl radical of 3 to 10 carbon atoms, an aralkyl radical of 7 to 10 carbon atoms or a phenyl radical, and can be identical to or different from each other, M is a polyvalent metal, except for Group IA of the Periodic Table, and n is zero or an integer of 1 or 2 and said sheet is substantially colorless at room temperature.

4,407,893

POLYOLEFIN COATING CONTAINING AN IONOMER FOR METAL SUBSTRATES

Andrew B. Malizio, Pelham, Ala., assignor to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Dec. 3, 1981, Ser. No. 326,979
Int. Cl.³ B32B 27/32; B05D 3/12
U.S. Cl. 428—454 32 Claims



24. A composite article comprising a ferrous metal substrate having an anchor pattern on a surface thereof, and a coating

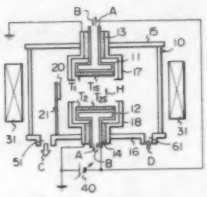
adhered to said anchor pattern, said coating comprising a mixture of a polyolefin and an ionomer, said polyolefin being a member selected from the group consisting of polyethylene, polypropylene, an ethylene-vinyl acetate copolymer, an ethylene-unsaturated carboxylic acid copolymer, and an ethylene-unsaturated carboxylic acid ester copolymer.

4,407,894

METHOD FOR PRODUCING A PERPENDICULAR MAGNETIC RECORDING MEDIUM

Sadao Kadokura, Hachioji; Takashi Tomie, Hino, and Masahiko Naoe, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 11, 1981, Ser. No. 329,822
Claims priority, application Japan, Dec. 12, 1980, 55/174680
Int. Cl.³ H01F *10/02*; C23C *15/00*
U.S. Cl. 428—457 **10 Claims**



1. A method for producing a perpendicular magnetic recording medium, wherein an hcp cobalt alloy layer which comprises mainly cobalt and additionally chromium and which has a direction of easy magnetization in a direction normal to the base is deposited on the base by means of a sputtering method, characterized in that a magnetic field is generated in a direction perpendicular to the surfaces of a pair of cathode targets arranged opposite to one another within a sputtering device, and said hcp cobalt alloy layer is deposited on the base, which is located beside a space between said pair of cathode targets and which faces said space.

4,407,895

SENSITIVE RESINS COMPRISING 2-ALKYLGLYCIDYL METHACRYLATE HOMOPOLYMER OR COPOLYMER

Jun Nakauchi, and Tomihiko Kawamura, both of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 161,225, Jun. 20, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,361
Claims priority, application Japan, Jul. 16, 1979, 54-90034
Int. Cl.³ B32B *15/08, 27/30*; C08F *20/32*
U.S. Cl. 428—463 **4 Claims**

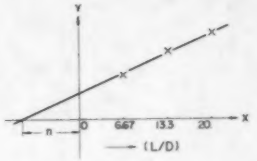
1. An article for use in electron beam lithography which comprises a suitable substrate and a suitable thickness of a negative resist film of a 2-alkylglycidyl methacrylate homopolymer or the copolymer containing at least 50 mol % of 2-alkylglycidyl methacrylate, the alkyl group of said 2-alkylglycidyl methacrylate having 1 to 4 carbon atoms and a number average molecular weight (Mn) of from 4,000 to 300,000 and the ratio (Mw/Mn) of weight average molecular weight (Mw) to number average molecular weight (Mn) is less than 3.0, the average molecular weight and weight average molecular weight being obtained from polystyrene conversion using gel permeation chromtography.

4,407,896

PROCESS FOR PREPARING A POLYOLEFIN RESIN-COATED PAPER FOR PHOTOGRAPHIC USE

Masashi Kubbota, and Toura Noda, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 23, 1981, Ser. No. 333,776
Claims priority, application Japan, Dec. 26, 1980, 55-188374
Int. Cl.³ B05D *3/02*; G03C *1/85, 1/86*
U.S. Cl. 428—513 **14 Claims**



1. In a process for preparing a polyolefin resin-coated paper for photographic use which comprises melt-extruding and coating a polyolefin resin composition containing titanium dioxide onto at least one surface of a paper sheet or a synthetic paper base,

the improvement comprises using as said polyolefin resin composition a composition having a physical property value n of not greater than 5 at 200° C. and a shearing rate of 1000/sec., where n is as shown in FIG. 3 of the drawings and is defined by an intersecting point of a straight line connecting the three measurement points and the X-axis, the three measurement points being obtained by employing three capillaries having different lengths L and different diameters D and plotting the L/D values, n being an absolute value which represents the contribution of admission resistance to the total resistance.

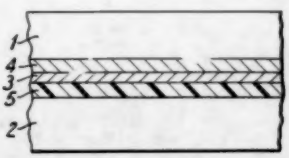
14. A polyolefin resin-coated paper for photographic use obtained by carrying out the process defined in claim **1**.

4,407,897

DRYING AGENT IN MULTI-LAYER POLYMERIC STRUCTURE

Christopher J. Farrell, Arlington Heights; Boh C. Tsai, Rolling Meadows, and James A. Wachtel, Buffalo Grove, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 10, 1979, Ser. No. 101,703
Int. Cl.³ B32B *9/00, 27/18*
U.S. Cl. 428—516 **75 Claims**



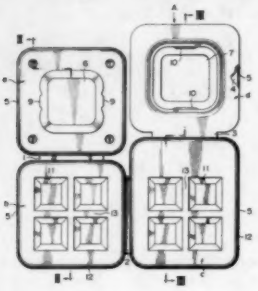
1. In a multi-layer polymeric structure having an interior layer of a moisture sensitive oxygen barrier polymer, the improvement which comprises the incorporation of a drying agent entrapped in a layer of the structure to protect said moisture sensitive layer.

4,407,898

CORNER PAD

Hideo Kato, and Hiroto Wada, both of Tokyo, Japan, assignors to Fukuoka Paper Manufacturing Co., Ltd., Fukuoka, Japan

Filed Feb. 24, 1982, Ser. No. 351,880
Int. Cl.³ B65D *81/02*
U.S. Cl. 428—542.8 13 Claims



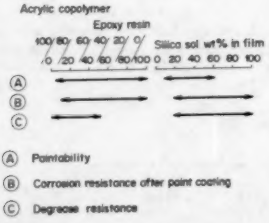
1. A corner pad comprising four substantially square hollow bodies made of a synthetic resin arranged substantially in a checkerboard pattern, all but one adjacent set of the hollow bodies being connected to each other along their adjacent edges by foldable pieces so as to form a three-faced body whose respective surfaces are substantially at right angles to each other in an erected condition by folding said four hollow bodies at the foldable pieces, and the two hollow bodies to be superposed in said erected condition being formed respectively with a protrusion and an opening fitting engageable with each other in said erected condition to retain the superposed condition of said two hollow bodies.

4,407,899

SURFACE TREATED STEEL SHEETS FOR PAINT COATING

Tomihiro Hara; Masahiro Ogawa; Masaaki Yamashita, and Yasuhisa Tajiri, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,664
Claims priority, application Japan, Dec. 24, 1980, 55-182111
Int. Cl.³ C25D *3/04, 11/38*
U.S. Cl. 428—626 12 Claims



1. A steel sheet having its surface prepared for paint coating consisting essentially of a base steel sheet "with an iron content of from 5 to 20% by weight", an iron-zinc film plated on the surface of said base sheet in an amount of at least 0.1 g/m^{2}with an iron content of from 3 to 30% by weight, and a composite silicate resin film coated on said iron-zinc alloy film in an amount of 0.05 to 5.0 g/m^2 and consisting essentially of an acrylic copolymer, an epoxy resin, a silica sol and a trialkoxysilane compound.

4,407,900

ELECTROPLATED CORROSION RESISTANT STEELS AND METHOD FOR MANUFACTURING SAME

Shigeki Kirihara, Kobe, and Masatoshi Iwai, Kakogawa, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 8, 1981, Ser. No. 309,782
Claims priority, application Japan, Oct. 17, 1980, 55-146019
Int. Cl.³ C25D *5/10*; B32B *15/18*
U.S. Cl. 428—659 10 Claims

1. A steel material with a treated high corrosion resistant surface, comprising on a base steel a first plateti layer of a Zn-Ni alloy consisting essentially of 5–20% of Ni and the balance Zn; and a second electroplated layer consisting essentially of zinc containing 0.005–0.5% of Cr.

4. A method for producing a steel material with a treated high corrosion resistant surface, comprising electroplating on said steel material a first layer of a Zn-Ni alloy consisting essentially of Zn and Ni in a first plating bath containing Zn and Ni wherein each concentration of Zn and Ni in said plating bath is over 20 g/l, respectively, and having a ratio of Zn concentration (g/l) to Ni concentration (g/l) in the range of 0.25–4, and electroplating on said first layer a second layer consisting essentially of Cr-containing zinc in a second electrogalvanizing bath with 0.1–10 g/l of Cr^{3+} and/or 0.05–0.5 g/l of Cr^{6+} content.

4,407,901

MAGNETIC RECORDING MEDIUM

Hajime Miyatsuka; Akira Kasuga, and Yasuyuki Yamada, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 10, 1981, Ser. No. 300,823
Claims priority, application Japan, Sep. 12, 1980, 55/126815
Int. Cl.³ G11B *5/70*; B32B *5/16*
U.S. Cl. 428—694 10 Claims

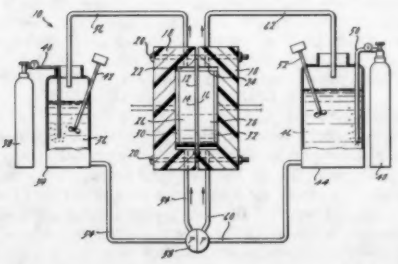
1. A magnetic recording medium, comprising:
a non-magnetic base; and
a magnetic layer on said base consisting mainly of ferromagnetic metal particles and a binder, said ferromagnetic particles are surface-treated with a polymer having a polar functional group and a degree of polymerization of not more than 100 and then dispersed in said binder.

4,407,902

CHEMICALLY REGENERABLE REDOX FUEL CELL AND METHOD OF OPERATING THE SAME

Joseph T. Kummer, Ypsilanti, and Djong-Gie Oei, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 8, 1980, Ser. No. 214,365
Int. Cl.³ H01M *8/06*
U.S. Cl. 429—15 3 Claims



1. A method of operating a chemically regenerable redox fuel cell which comprises the steps of:
providing a catholyte solution, said catholyte solution being

one which is reoxidized from a reduced state to an oxidized state by direct exposure of said catholyte solution to oxygen, said catholyte solution also being reducible from its oxidized state ot its reduced state;

providing an anolyte solution, said anolyte solution being one which is reduced from an oxidized state to a reduced state by direct exposure of said anolyte solution to hydrogen, said anolyte solution also being oxidizable from its reduced state to its oxidized state;

exposing said catholyte solution to oxygen at a first reservoir;

heating said first reservoir to a temperature suitable for oxidation of said catholyte solution;

exposing said anolyte solution to hydrogen at a second reservoir;

heating said second reservoir to a temperature suitable for reduction of said anolyte solution;

providing a cationic exchange membrane having first and second faces separated by a thickness thereof;

circulating said catholyte solution between said first reservoir and one face of said cationic exchange membrane;

circulating said anolyte solution between said second reservoir and the other face of said cationic exchange membrane;

whereby said catholyte solution is alternately oxidized at said first reservoir and reduced at said one face of said cationic exchange membrane and said anolyte solution is alternatively reduced at said second reservoir and oxidized at said other face of said cationic exchange membrane.

4,407,903

ELECTRIC DC SOURCE

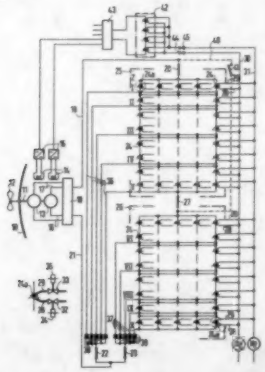
Heinrich Gutbier, Röttenbach; Karl Strasser, Erlangen; Elmar Limberg, Lübeck, and Volker Jensen, Krummesse, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Ingenieurkontor Lübeck, Lübeck, both of, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,709

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043692

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—23 **3 Claims**



1. In an electric dc source made up of fuel cells or fuel batteries, each having terminals of one and the other polarity, which are fed by gas supplies and are connected in series or in series and parallel, one end of the series connection being of the one polarity and having a terminal coupled to a bus bar of that same polarity, the improvement comprising:

(a) a separate gas supply line and a controlled valve disposed in each gas supply line for each fuel cell or fuel battery; and

(b) electric valves coupling the respective terminals of each of the series connected fuel cells or fuel batteries having the other polarity to a bus bar of said other polarity, whereby said fuel cells or fuel batteries can be controlled by controlling the supply of gas thereto thus controlling the overall voltage supplied by said dc source with isolation achieved by means of said electric valves.

4,407,904

FUEL CELL

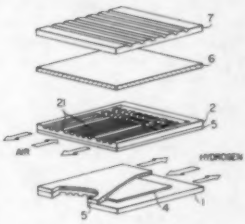
Norihira Uozumi, Hitachi; Takeo Yamagata, Takahagi; Saburo Yasukawa, Hitachi; Yasuyuki Tsutsumi, Hitachi, and Seiichiro Ono, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,813

Claims priority, application Japan, Feb. 20, 1981, 56/24654

Int. Cl.³ H01M *8/02, 8/24*

U.S. Cl. 429—26 **8 Claims**



1. In a fuel cell comprising a plurality of unit cells each comprising a fuel electrode plate, an oxidizing agent electrode plate and a matrix, the fuel electrode plate and the oxidizing agent plate being disposed face-to-face through the matrix, the unit cells being stacked through separators between the unit cells, forming a stacked assembly, a gas flow passage for fuel electrode and oxidizing agent electrode being provided on one side each of the electrode plates or the separators, and manifolds for gas supply and discharge to the gas flow passages on the electrode plates or the separators being provided at sides of the stacked assembly, an improvement comprising the gas flow passage having at least one gas inlet and at least one gas outlet at one outer edge of the electrode plate or separator, the at least one gas inlet and the at least one gas outlet adjacent thereto being isolated by at least one partition wall extended therebetween along a gas flow direction and open at a position most remote from the gas inlet and gas outlet, thereby forming a U-type passage having at least one gas inflow path starting at said at least one inlet and at least one gas outflow path ending at said at least one outlet, said at least one gas inflow path and said at least one gas outflow path communicating with each other at the most remote position, the gas flow passage for the fuel electrode and the gas flow passage for the oxidizing agent electrode being arranged in a counter-current relation to each other, the at least one gas inlet and the at least one gas outlet for the fuel electrode and the at least one gas inlet and the at least one gas outlet for the oxidizing agent electrode being provided at the opposite sides of the stacked assembly, respectively, and communicated respectively with the manifolds provided at the same opposite sides of the stacked assembly.

4,407,905
FUEL CELL

Seizi Takeuchi, Hitachiota; Kenzo Ishii, Hitachi; Toshiki Kahara, Tokaimura; Jinichi Imahashi, Hitachi; Masato Takeuchi, Katsuta; Hideo Okada; Sigeru Okabe, both of Hitachi; Shimpei Matsuda, Tokaimura; Fumito Nakajima, Hitachi; Hirosi Tobita, Kitaibaraki, and Kohki Tamura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

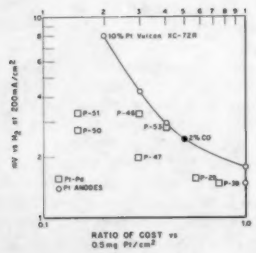
Filed Oct. 14, 1981, Ser. No. 311,179
Claims priority, application Japan, Oct. 14, 1980, 55-142378
Int. Cl.³ H01M 4/86
U.S. Cl. 429—42 32 Claims

1. A fuel cell which comprises at least one gas diffusion electrode, said gas diffusion electrode comprising an electron-conductive, gas-permeable substrate and an electrode catalyst uniformly distributed on the substrate, the electrode catalyst comprising colonies each consisting of not more than about 20 primary particles of nobel metal, with each particle having a size of 10–30 Å, and the colonies being uniformly distributed and deposited on carrier powder.

4,407,906
FUEL CELL WITH PT/PD ELECTROCATALYST ELECTRODE

Paul Stonehart, Madison, Conn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Nov. 3, 1981, Ser. No. 317,818
Int. Cl.³ H01M 4/86
U.S. Cl. 429—42 10 Claims



COMPARISON OF ANODE ELECTRODE PERFORMANCES AT 100°C IN 100% H_3PO_4 ON 10% CARBON MONOXIDE 90% HYDROGEN AT 200mA/cm² AS A FUNCTION OF CATALYST COST RATIOED TO THE COST OF 0.5mg Pt/cm² Pt VULCAN XC-72R.

1. An electrochemical cell comprising: (1) a pair of electrodes separated by an electrolyte and (2) a fuel gas comprising about 10 to 30% CO wherein the improvement comprises having at least one of said electrodes consisting of a graphitized or partially graphitized carbon support having on the surface thereof, an electrocatalytic material consisting of a platinum-palladium alloy and a hydrophobic binder.

4,407,907
AIR ELECTRODE

Tsutomu Takamura, Yokohama; Yuichi Sato, Atsugi; Toshiaki Nakamura, Yono, and Nobukazu Suzuki, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 30, 1981, Ser. No. 325,753
Claims priority, application Japan, Dec. 23, 1980, 55-181394
Int. Cl.³ H01M 4/90, 4/96
U.S. Cl. 429—42 18 Claims

1. An air electrode for use in carrying out electrochemical reduction of an oxygen gas, which comprises an electrode body comprised of a porous body and a fluorine-containing solvent incorporated therein, said fluorine-containing solvent being a liquid at room temperature and having a boiling point of from about 50° to 350° C., an oxygen-dissolving power of at least about 15% by volume, and a surface tension of not greater than about 50 dyne/cm.

4,407,908
CATHODE FOR AN ELECTROLYSER

Anthony J. Appleby, Boulogne, and Gilles Crepy, Evry, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

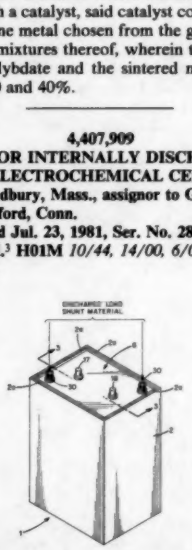
Filed Feb. 1, 1979, Ser. No. 8,443
The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.
Int. Cl.³ H01M 4/52; C25B 11/04
U.S. Cl. 429—45 2 Claims

1. A cathode for an electrolyser, said cathode comprising a porous conductive material which includes sintered nickel impregnated with a catalyst, said catalyst comprising a molybdate of at least one metal chosen from the group consisting of nickel, iron and mixtures thereof, wherein the ratio of weight between the molybdate and the sintered nickel lies substantially between 20 and 40%.

4,407,909
METHOD FOR INTERNALLY DISCHARGING AN ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 23, 1981, Ser. No. 286,218
Int. Cl.³ H01M 10/44, 14/00, 6/00, 6/20
U.S. Cl. 429—50 15 Claims



1. A method for completing the discharge of an electrochemical cell in which the discharge has prematurely ceased or has significantly diminished as a result of which chemically consumable components of the cell remain to be consumed, said electrochemical cell including at least one anode structure, at least one cathode structure, and an eletrolytic solution disposed within a housing, one or more of the aforesaid components being subject to consumption during discharge of the cell, said cell further including a pair of electrical terminals extending external of the housing adapted to be coupled to an external load during discharge, and electrical metal terminal

connections internal of the housing between the anode and cathode structures and the electrical terminals for making electrical connections between the anode and cathode structures and the associated terminals, said method being utilized in the event of an open circuit break or other impairment of the electrical connections between the anode and/or cathode structures and associated terminals causing a cessation or significant diminishing of the discharge of the cell, said method comprising the step of:

introducing an electrically-conductive load shunt material into the cell internal of the housing to bridge the electrical metal terminal connections internal of the housing, said material being selected to be chemically inert with the internal components of the cell and being operative to establish an electrical load shunt internal of the housing across the electrical metal terminal connections internal of the housing for permitting discharge of the cell until consumable components of the cell have been consumed by chemical reaction within the cell causing termination of chemical action within the cell; wherein the electrically-conductive load shunt material is selected to permit discharge of the cell to take place at a rate below the original rated discharge rate of the cell.

4,407,910

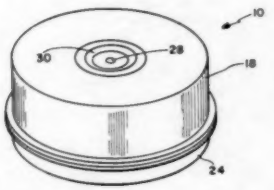
ANODE NEUTRALIZATION

Vincent O. Catanzarite, 7044 Mira Vista, Las Vegas, Nev. 89120

Continuation-in-part of Ser. No. 32,298, Apr. 23, 1979, abandoned, which is a continuation of Ser. No. 893,201, Apr. 3, 1978, abandoned. This application Sep. 28, 1981, Ser. No. 306,132

Int. Cl.³ H01M *10/34*

U.S. Cl. 429—57 **6 Claims**



1. A method of preventing violent reaction in an electrochemical cell comprising an alkali metal anode material, cathode material and electrolyte consisting of a solute dissolved in an oxyhalide or thiohalide solvent comprising the step of placing a ceramic material contiguous to said anode material within said cell, said ceramic material being substantially inactive below a predetermined temperature whereby said ceramic material is capable of reacting at said predetermined temperature to form a product with said anode material, said product being substantially inactive and said reaction being at most mildly exothermic, wherein said ceramic material consists essentially of 95% Al_2O_3 and 5% SiO_2 by weight.

4,407,911

RECHARGEABLE ELECTROCHEMICAL CELL PACK HAVING RESISTANCE TO IMPACT AND VIBRATION

John W. Hooke, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

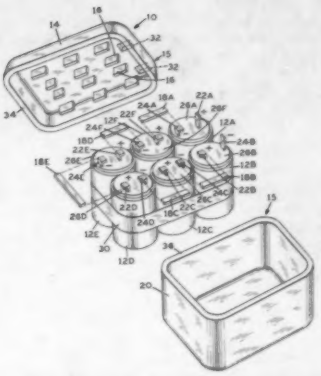
Filed Oct. 1, 1980, Ser. No. 192,826

Int. Cl.³ H01M *2/10*

U.S. Cl. 429—94 **14 Claims**

1. A rechargeable electrochemical cell pack comprising:

a plurality of rechargeable electrochemical cells mounted in said casing, and said plurality of electrochemical cells each being in integral connection with said casing, said integral connection between each of said plurality of electrochemical cells and said casing comprised of at least one lug projection which extends from said casing and is integrally connected to each of said plurality of electrochemical cells; and



means at the interior of said casing for interconnecting said casing for interconnecting said electrochemical cells in an electrical circuit, said electrical circuit having a positive lead and a negative lead.

4,407,912

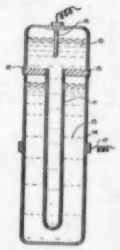
ELECTROCHEMICAL CELL UTILIZING MOLTEN ALKALI METAL ELECTRODE-REACTANT

Anil V. Virkar, Sandy, and Gerald R. Miller, Salt Lake City, both of Utah, assignors to Ceramatec, Inc. and University of Utah, both of Salt Lake City, Utah

Filed Oct. 13, 1981, Ser. No. 310,859

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—104 **14 Claims**



1. An improved electrochemical cell comprising;

a first electrode of a molten alkali metal;

a solid, impervious electrolyte containing a mobile alkali metal ion of the same alkali metal as is present in said first electrode, said electrolyte separating said first electrode from a second electrode;

a second electrode of a molten material receptive to the mobile alkali-metal ion in said electrolyte; and

at least sufficient selenium present at the interface between said molten alkali metal of said first electrode and said electrolyte to effect a lowering of the internal cell resistance.

4,407,913

ELECTRODE COATING COMPOSED OF COPOLYMERS DERIVED FROM DIACETONE ACRYLAMIDE

Guy Rampel, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Continuation of Ser. No. 157,313, Jun. 9, 1980, Pat. No. 4,298,667, which is a division of Ser. No. 966,745, Dec. 5, 1978, Pat. No. 4,245,016. This application Mar. 17, 1981, Ser. No. 244,789

The portion of the term of this patent subsequent to Jan. 13, 1998, has been disclaimed.

Int. Cl.³ H01M 4/62

U.S. Cl. 429—137 8 Claims

1. In an electrode, the improvement comprising an electrode coating consisting essentially of a copolymer derived from diacetone acrylamide and a polymerizable monomer; and a finely divided active electrode material.

4,407,914

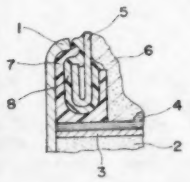
ALKALINE GALVANIC CELL

Takao Inoue, Hirakata; Tamotsu Wakahata, Katano; Keigo Momose, and Yukio Maeda, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 21, 1981, Ser. No. 333,190

Int. Cl.³ H01M 2/08

U.S. Cl. 429—174 7 Claims



1. An alkaline galvanic cell which comprises an anode sealing plate in the form of a layered clad plate having an innermost copper layer, in which an anode active substance is accommodated, a cathode container in which a cathode active substance is housed, an insulating packing provided around the peripheral edge of said anode sealing plate which is fitted into said cathode container for hermetically sealing said cell, a layer of epoxy adduct polyamide amine disposed at a sealing portion of said anode sealing plate between said innermost copper layer of said anode sealing plate and said insulating packing, said epoxy adduct polyamide amine being thermo-plastic, with a tack even after assembly of said cell and having amine valence in the range of 50 to 400.

4,407,915

SECONDARY ZINC ELECTRODE

David J. Brown, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

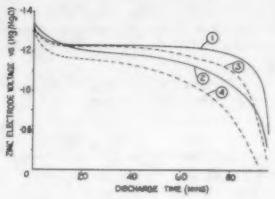
Continuation of Ser. No. 159,656, Jun. 16, 1980. This application Nov. 12, 1981, Ser. No. 320,841

Claims priority, application United Kingdom, Jun. 26, 1979, 7922176

Int. Cl.³ H01M 4/62

U.S. Cl. 429—217 13 Claims

1. In a pressed, secondary zinc electrode for a secondary cell, the improvement comprising said electrode having dispersed therein particulate carbon in an amount between 20 and 50% by weight of the total weight of zinc and carbon and an



organic binder in an amount between 0.5 and 10% by weight of the total weight of zinc and carbon.

4,407,916

PROCESS FOR FORMING FLUORESCENT SCREEN

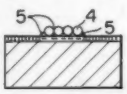
Motoo Akagi, Hinodemachi; Shoichi Uchino, Hachioji, and Saburo Nonogaki, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,263

Claims priority, application Japan, Mar. 19, 1981, 56-37636[U]; Feb. 1, 1982, 57-13279

Int. Cl.³ G03C 5/00

U.S. Cl. 430—23 23 Claims



1. A process for forming a fluorescent screen, where patterns each of individual phosphors are formed in zones discrete from one phosphor to another on a substrate surface from at least two kinds of phosphors, which comprises (1) a first step of applying a thin layer of a photosensitive substance capable of turning tacky by light exposure, (2) a second step of exposing the thin layer to light irradiation according to a pattern of one kind of the phosphors, thereby tackifying the light-exposed parts, and (3) a third step of applying particles of the said one kind of the phosphors, and a finer particulate filling material than the particles of the phosphor, to the tackified parts of the thin layer after the light exposure, said finer particulate filling material being at least one material selected from the group consisting of:

(i) metal phosphates;

(ii) SiO_2;

(iii) $MgCO_3$;

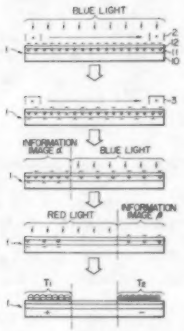
(iv) powders of organic polymer having a heat decomposition point of less than 450° C.; and

(v) much finer particles of phosphor having substantially the same color emission as that of the phosphor in the phosphor layer to be treated with the finer particulate filling material, thereby forming the pattern of the said one kind of the phosphors having the finer particulate filling material filling in clearances between the phosphor particles and between the phosphor particles and peripheries of the tackified parts.

4,407,917
INFORMATION IMAGE SYNTHESIZING AND COPYING METHOD

Katsuo Sakai, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 22, 1979, Ser. No. 68,666
Claims priority, application Japan, Aug. 28, 1978, 53-104727
The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.
Int. Cl.³ G03G 13/01
U.S. Cl. 430—42 9 Claims



1. A method of synthesizing the information image of a first original (I) and the information image of a second original (II) and copying the respective information images on one copying sheet, using a photoconductor comprising a conductive base member, a first photoconductive layer having a spectral sensitivity to A-colored light, but not having a spectral sensitivity to B-colored light, said first photoconductive layer formed on said conductive base member, a second photoconductive layer having a spectral sensitivity to said B-colored light but not having a spectral sensitivity to said A-colored light, said second photoconductive layer formed on said first photoconductive layer, comprising the steps of:

performing a first charging for charging a photoconductor to a predetermined polarity under the illumination of light capable of making either said first photoconductive layer or said second photoconductive layer conductive,

performing a second charging for applying charges of the polarity opposite to the polarity of said first charging to said photoconductor,

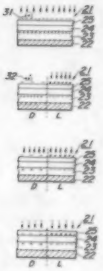
exposing said photoconductor to an A-colored light image of said first original (I) and a B-colored light image of said second original (II),

forming synthesized latent electrostatic images, in which the surface potential of a portion of said photoconductor, corresponding to the blank portions common to said originals (I) and (II), is nearly zero, and the surface potential of a portion of said photoconductor, corresponding to information image of said first original (I), and the surface potential of a portion of said photoconductor, corresponding to information image of said second original (II) are opposite in the polarity, and

developing said synthesized latent electrostatic images by developer.

4,407,918
ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS FOR MAKING PLURAL COPIES FROM A SINGLE IMAGE

Eiichi Sato, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 348,839
Claims priority, application Japan, Feb. 17, 1981, 56-20825
Int. Cl.³ G03G 13/22
U.S. Cl. 430—54 52 Claims

1. An electrophotographic process for forming at least one copy of a document by means of an electrophotographic photosensitive member including an electrically conductive substrate, a first photoconductive layer applied on the substrate, a charge retentive layer made of electrically insulating material and applied on the first photoconductive layer and a second photoconductive layer applied on the charge retentive layer, comprising

the step of projecting an image of the document to be duplicated onto the photosensitive member with the aid of a first light to which the second photoconductive layer is substantially insensitive, but the first photoconductive layer is sensitive, while the photosensitive member is charged;

the step of uniformly exposing the photosensitive member to said first light, said exposing step being effected after said image projecting step; and

the step of uniformly exposing the photosensitive member to second light to which said second photoconductive layer is sensitive, whereby an electrostatic charge image is formed in said photosensitive member by means of electrostatic charges trapped across said charge retention layer.

36. An electrophotographic photosensitive member for use in an electrophotographic process according to claim 1, comprising

a substrate made of electrically conductive material;

a first photoconductive layer applied on said conductive substrate;

a charge retentive layer made of electrically insulating material and applied on said first photoconductive layer; and

a second photoconductive layer applied on said charge retentive layer which is substantially insensitive to the first light to which the first photoconductive layer is sensitive.

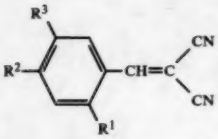
4,407,919
ELECTROPHOTOGRAPHIC PLATE

Tetsuo Murayama, Machida; Shigenori Otsuka, Tokyo; Tsunemitsu Tajima, Kawasaki, and Yukihiro Sato, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,842
Claims priority, application Japan, Jul. 7, 1981, 56-105954
Int. Cl.³ G03G 5/14
U.S. Cl. 430—58 **5 Claims**

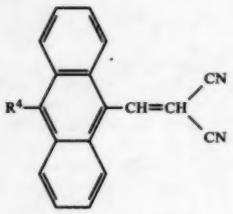
1. A double-layered electrophotographic plate having at least a charge generating layer and a charge transporting layer on an electroconductive substrate, wherein said charge transporting layer comprises

(a) a dicyano vinyl compound represented by general formula (I):



(I)

where R^1 and R^3 independently represent hydrogen, halogen, cyano, nitro or a substituted- or unsubstituted-arylcarbonyloxy group, and R^2 represents hydrogen, halogen, cyano or a substituted- or unsubstituted-arylcarbonyloxy group with the proviso that R^1, R^2 and R^3 are not simultaneously hydrogen, and/or a dicyano vinyl compound repreented by general formula (II):



(II)

where R^4 represents hydrogen, halogen, lower alkyl or aryl group, and

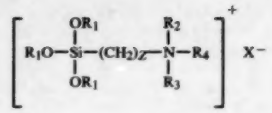
(b) an electron-donating organic compound.

4,407,920
SILICONE AMMONIUM SALTS AND PHOTORESPONSIVE DEVICES CONTAINING SAME

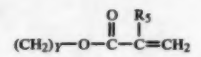
Liang-Huang Lee, Webster, and Deborah N. Landry, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1982, Ser. No. 360,109
Int. Cl.³ G03G 8/00
U.S. Cl. 430—59 **26 Claims**

1. An improved photoresponsive device consisting essentially of a substrate, a photoconductive composition comprised of an inorganic photoconductive composition, or a layered organic photoresponsive device comprised of a photogenerating layer and a charge transport layer, followed by an overcoating top layer of a silicone resin containing therein as an adhesive layer a silicone containing ammonium salt of the formula



wherein, R_1, R_2, R_3, are independently selected from the group consisting of aliphatic and substituted aliphatic radicals, R_4 is selected from the group consisting of aliphatic radicals, substituted aliphatic radicals, and the group



wherein Y is anumber of from about 2 to about 4, and R_5 is hydrogen or an alkyl radical, X is an anion, and Z is a number of from 1 to about 5.

4,407,921
ELECTROPHOTOGRAPHIC ELEMENTS WITH POLYESTER BINDER RESINS HAVING APROTIC END GROUPS

Everett W. Bennett, Longmeadow, and Jan B. Suchy, Holyoke, both of Mass., assignors to James River-Graphics, Inc., South Hadley, Mass.

Filed Nov. 10, 1981, Ser. No. 320,064
Int. Cl.³ G03G 5/087, 5/04
U.S. Cl. 430—96 **13 Claims**

1. A photoconductive element suitable for use in electrophotography comprising a support having coated thereon a photoconductive composition comprising a photoconductor and a matrix for said photoconductor, said matrix comprising a linear, film-forming polyester resin having the terminal hydroxyl and carboxyl groups thereof modified with an aprotic group, said polyester resin having a number average molecular weight of from about 8,000 to about 50,000, wherein said aprotic group is a urethane group derived from a monoisocyanate, an ether group, an ester group, an amide group or a combination thereof.

4,407,922
PRESSURE SENSITIVE TONER COMPOSITIONS

Bernard Grushkin, Pittsford, and Jacques C. Bertrand, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1982, Ser. No. 338,683
Int. Cl.³ G03G 11/00
U.S. Cl. 430—98 **21 Claims**

1. An improved cold pressure fixable toner composition comprised of a blend of two immiscible polymers selected from the group consisting of (1) a polymer of polystyrene-co-stearylmethacrylate as a hard component, having a number average molecular weight of from about 8,000 to about 20,000, and a glass transition temperature within the range of from about 50 degrees Centigrade to about 65 degrees Centigrade, and poly[octadecyl vinyl ether-co-maleic anhydride], having a number average molecular weight of from about 5,000 to about 20,000, as a soft component, and (2) polyisobutylmethacrylate compositions as a hard component, having a number average molecular weight of from about 100,000 to about 200,000, and a glass transition temperature of from about 50 degrees Centigrade to about 60 degrees Centigrade, and poly[octadecyl vinyl ether-co-maleic anhydride] as a soft component, the soft component being present in an amount of from about 35 percent by weight to about 75 percent by weight, and the hard component being present in an amount of from about 25 weight percent to about 65 weight percent.

4,407,923

ONE COMPONENT MAGNETIC DEVELOPER

Nobuhiro Miyakawa, Suita; Masanori Fujii, Sakai; Kouzi Masekawa, Kyoto; Haruo Koyama, Hirakata, and Takashi Teshima, Amagasaki, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1982, Ser. No. 391,721
Claims priority, application Japan, Jun. 26, 1981, 56-98281
Int. Cl.³ G03G 9/14, 9/08
U.S. Cl. 430—106.6 6 Claims

1. A dry magnetic developer consisting essentially of a particulate shaped article of a composition comprising a binder resin medium and a powdery magnetic material dispersed in the binder resin medium, wherein said composition comprises as the powdery magnetic material a non-pulverizing agglomerate having a secondary particle size of 1 to 10 microns, which is formed by granulating and sintering fine cubic particles of magnetite or other ferrite having a primary particle size of 0.1 to 1 micron.

4,407,924

TONER COMPLEXES FOR DEVELOPING ELECTROSTATIC IMAGES

Hisashi Senshu, Neyagawa; Kazuhiro Ishikawa, Nara; Yukihiko Ishida, Neyagawa, and Yoji Kawagishi, Yawata, all of Japan, assignors to Orient Chemical Industries, Ltd., Japan

Filed Jan. 15, 1982, Ser. No. 339,491
Claims priority, application Japan, Jan. 23, 1981, 56-9249
Int. Cl.³ G03G 9/08
U.S. Cl. 430—109 28 Claims

1. A toner for developing electrostatic images comprising a metal complex of an aromatic dicarboxylic acid, which such acid is capable of forming its corresponding acid anhydride, and an aromatic hydroxycarboxylic acid which is capable of forming a corresponding complex compound.

4,407,925

PROCESS FOR DEVELOPING ELECTROSTATIC IMAGES WITH MAGNETIC TONER

Alan J. Liebman, Skokie, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 13, 1981, Ser. No. 243,393
Int. Cl.³ G03G 13/09
U.S. Cl. 430—122 13 Claims

1. A method of developing electrostatic latent images comprising providing a developer composition comprising substantially uncharged magnetic toner particles having a resistivity greater than about 10^{16} ohm-cm and less than about 10^{18} ohm-cm at an electric field of about 10 volts/cm and a resistivity greater than about 10^{12} ohm-cm at an electric field of about 1,000 volts/cm magnetically bound by an induced magnetic field to conductive magnetic carrier particles, providing a magnetic brush member having magnetic fields which temporarily magnetize said magnetic toner particles, magnetically transporting said developer composition on said magnetic brush member into and through a development zone between an electrostatic latent image bearing member and said magnetic brush member, maintaining the thickness of the toner particle layer on the outermost carrier particles on said magnetic brush member in said development zone between about 5 micrometers and about 100 micrometers, and maintaining the potential of said electrostatic latent image in said development zone at a level sufficient to induce an opposite charge in toner particles in said toner particle layer in said development zone and to overcome the magnetic attraction between the magnetic toner particles and the magnetic carrier particles whereby toner particles are attracted from carrier particles in said development zone to said electrostatic latent image.

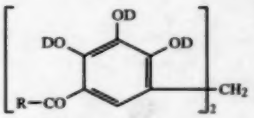
4,407,926

LIGHT-SENSITIVE MIXTURE COMPRISING O-NAPHTHOQUINONE-DIAZIDES AND LIGHT SENSITIVE COPYING MATERIAL PREPARED THEREFROM

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,489
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1980, 3043967
Int. Cl.³ G03C 1/54; C07C 113/00
U.S. Cl. 430—165 35 Claims

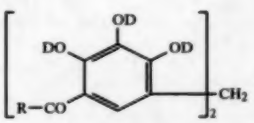
1. A light-sensitive composition comprising a water-insoluble resinous binder which is soluble or swellable in aqueous alkaline solutions and a naphthoquinonediazide-sulfonic acid ester corresponding to the formula I



(I)

wherein D represents a radical selected from the group consisting of 1,2-naphthoquinone-2-diazide-4-sulfonyl radicals and 1,2-naphthoquinone-2diazide-5-sulfonyl radicals and R represents a radical selected from the group consisting of alkyl radicals and aryl radicals.

30. A light-sensitive compound of the formula I



(I)

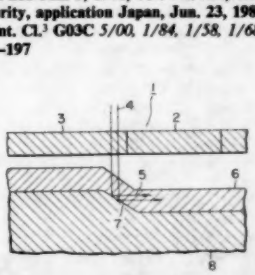
wherein D represents a radical selected from the group consisting of 1,2-naphthoquinone-2-diazide-4-sulfonyl radicals and 1,2-naphthoquinone-2-diazide-5-sulfonyl radicals and R represents a radical selected from the group consisting of alkyl radicals and aryl radicals.

4,407,927

PHOTORESIST COMPOSITION

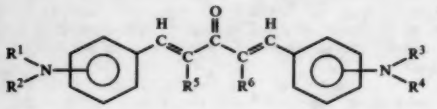
Yoichi Kamoshida; Toshiaki Yoshihara, both of Yokohama; Yoshiyuki Harita, Kawasaki, and Kunihiro Harada, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,480
Claims priority, application Japan, Jun. 23, 1981, 56-96963
Int. Cl.³ G03C 5/00, 1/84, 1/58, 1/68
U.S. Cl. 430—197 14 Claims



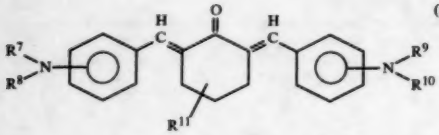
1. A photoresist composition comprising a cyclized product of a conjugated diene homopolymer or copolymer, a photocrosslinking agent soluble in an organic solvent and at least one

member selected from the group consisting of compounds represented by the formulas (I) and (II):



(I)

or



(II)

wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9, R^{10} and R^{11}, which may be identical or different, represent substituents selected from the group consisting of hydrogen atom and alkyl groups.

8. A photoresist composition according to claim **1**, **2**, **3**, **4** or **5**, wherein said photo-crosslinking agent soluble in an organic solvent is an azide type photosensitive substance.

4,407,928

USE OF KETAL BLOCKED QUINONES TO REDUCE POST-PROCESS D_{min} INCREASE IN POSITIVE REDOX DYE-RELEASING IMAGE TRANSFER SYSTEMS

Noel R. Vanier, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,502

Int. Cl.³ G03C *1/40, 5/54, 1/10*

U.S. Cl. 430—214 **27 Claims**

1. In a photographic assemblage comprising:

(a) a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a nondiffusible, positive-working, redox dye-releaser capable of releasing a diffusible dye upon reduction;

(b) a dye image-receiving layer;

(c) an alkaline processing composition and means for discharging same within said assemblage; and

(d) a transparent cover sheet located over the layer outermost from said support; said photographic element or said processing composition containing an electron transfer agent, said photographic element or said cover sheet containing a neutralizing layer;

the improvement wherein said alkaline processing composition contains a ketal blocked quinone which is soluble therein.

4,407,929

COLOR PHOTOGRAPHIC RECORDING MATERIAL FOR THE PRODUCTION OF COLORED IMAGES BY THE DYE DIFFUSION TRANSFER PROCESS

Immo Boie, Langenfeld, and Kaspar Wingender, Leverkusen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,777

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045183

Int. Cl.³ G03C *5/54, 1/40, 1/10*

U.S. Cl. 430—220 **6 Claims**

6. The color photographic recording material, comprising a transparent layer support, a photo-sensitive element containing at least one photo-sensitive silver halide emulsion layer and a non-diffusing color providing compound associated therewith, an opaque light-reflecting layer and an image-receiving layer which may be dyed by diffusible dyes, in which the improvement comprises the transparent layer support, the photo-sensitive element, the opaque light-reflecting layer and the image-receiving layer form a non-disconnectable laminate in which the support, the element and the layers adhere firmly to each other in the sequence indicated and the silver halide emulsion layer or layers has/have associated to it/them:

(1) an electron donor compound (ED compound);

(2) as color-providing compound a non-diffusing reducible compound which, in reduced form, liberates a diffusible dye under alkaline development conditions and an additional transparent layer is arranged on the reverse side of the transparent layer support, said additional layer containing an agent capable of producing a white haze during processing.

4,407,930

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING SUBSTITUTED SULFONAMIDOPHENOL OR SULFONAMIDONAPHTHOL DYE-RELEASERS

Robert E. Ross; Lee J. Fleckenstein, both of Rochester, and Michael E. Campbell, Kendall, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 21, 1982, Ser. No. 380,845

Int. Cl.³ G03C *1/40, 1/10, 5/54*

U.S. Cl. 430—223 **28 Claims**

11. In a photographic assemblage comprising:

(I) a support having thereon at least one photosensitive silver halide emulsion layer, said emulsion layer having associated therewith a nondiffusible, redox, dye-releasing compound comprising a ballasted, sulfonamidophenol or sulfonamidonaphthol compound having a dye moiety attached thereto through the sulfonamido group of said compound, said sulfonamido group being located in a position which is conjugated with respect to the position of the hydroxy group of said compound; and

(II) a dye image-receiving layer; the improvement wherein:

(a) said compound has at least one substituent thereon in a position which is conjugated with respect to the position of said sulfonamido group, said substituent being selected from the group consisting of OH, $NHSO_2R$ and NHCOR, wherein R is alkyl having from 1 to about 40 carbon atoms, substituted alkyl having from 1 to about 40 carbon atoms, aryl having from 6 to about 50 carbon atoms, or substituted aryl having from 6 to about 50 carbon atoms, and

(b) said compound not having a hydroxy, alkoxy, aryloxy, sulfonamido, phosphonamido or carbonamido group thereon in a position which is conjugated with respect to the position of the hydroxy group of said compound,

with the proviso that when said compound is a 2-sulfonamidophenol, said substituent is located in the 5-position or in both the 3- and 5-positions.

4,407,931

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NONDIFFUSIBLE YELLOW AZO METAL COMPLEXED DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF

Steven Evans, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,509

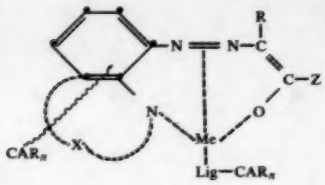
Int. Cl.³ G03C *1/40, 1/10, 7/00, 5/54*

U.S. Cl. 430—223 **38 Claims**

20. In a photographic assemblage comprising:

(i) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and

(ii) a dye image-receiving layer; the improvement wherein said dye image-providing material is a nondiffusible compound having at least one releasable yellow dye moiety or precursor thereof, said compound having the formula:



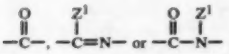
wherein:

(a) X represents the atoms necessary to complete a 5- or 6-membered aromatic heterocyclic fused ring;

(b) Z represents alkyl, substituted alkyl, aryl or substituted aryl;

(c) R represents CN or J—L;

(d) J represents a bivalent



group;

(e) L represents alkyl, substituted alkyl, aryl, substituted aryl, or can be taken together with Z to complete a carbonyl-containing 5- or 6-membered heterocyclic or carbocyclic ring;

(f) Z^1 represents the same groups as Z;

(g) each CAR independently represents a ballasted carrier moiety capable of releasing said diffusible yellow dye moiety or precursor thereof as a function of development of said silver halide emulsion layer under alkaline conditions;

(h) each n is 0 or 1, with the proviso that at least one n is 1;

(i) Lig is a monoanionic tridentate ligand; and

(j) Me is a polyvalent, hexacoordinate metal ion.

4,407,932

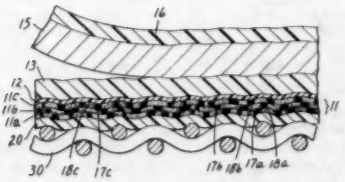
FADE-RESISTANT AND ABRASION RESISTANT PHOTOGRAPHIC REPRODUCTION, METHOD OF PREPARING, AND PHOTOGRAPHIC PRODUCT THEREFOR

Harry A. Loder, Mahtomedi, and Charles A. Mathna, St. Paul, both of Minn., assignors to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Division of Ser. No. 242,842, Mar. 12, 1981, abandoned, Continuation-in-part of Ser. No. 50,686, Jun. 21, 1979, abandoned. This application Jan. 4, 1982, Ser. No. 337,071

Int. Cl.³ G03C 1/90, 1/84, 7/00

U.S. Cl. 430—256 **1 Claim**



1. A simple and convenient method of preparing a fade-resistant and abrasion-resistant full color photographic reproduction comprising the steps of

a. obtaining a photographic paper comprising

(1) a paper core having a face side and a back side,

(2) a first low density polyethylene foil bonded to the face side but removable therefrom with a force of 6–10 grams per centimeter width,

(3) a second low density polyethylene foil bonded to the back side,

(4) overlying the first foil and bonded thereto a full-color light-sensitive element comprising a plurality of superposed strata of photographic emulsions containing disposed siver halide particles, each stratum containing a dye coupler, the outermost stratum containing a cyan or magenta coupler precursor and the innermost stratum containing a yellow coupler,

b. exposing the light-sensitive element through a colored negative to create a latent image and,

c. developing and fixing the latent image,

d. applying a uniform layer of adhesive over the outermost stratum,

e. bonding the image-bearing photographic paper to a desired substrate via said adhesive, and

f. stripping away the paper core and second polyethylene foil to leave a full-colored photograph bonded to said substrate, the outermost stratum of the previously light-sensitive element now containing the yellow dye, which absorbs ultraviolet radiation, whereby the photographic reproduction is rendered resistant to fading, said first polyethylene foil covering the previously light-sensitive element, whereby the photographic reproduction is protected from abrasion.

4,407,933

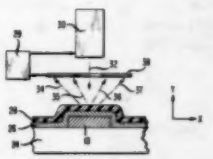
ALIGNMENT MARKS FOR ELECTRON BEAM LITHOGRAPHY

David B. Fraser, Berkeley Heights, and Roderick K. Watts, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 11, 1981, Ser. No. 272,497

Int. Cl.³ G03C 5/00

U.S. Cl. 430—296 **12 Claims**



1. A method of fabricating integrated circuits on a semiconductive wafer by directly processing the wafer in an electron beam exposure system, said method comprising the steps of

forming tantalum disilicide alignment marks in spaced-apart regions of said wafer,

depositing a resist structure including at least a layer of electron-sensitive resist material on said wafer overlying said alignment marks,

scanning the marks with said electron beam,

detecting electrons back-scattered from said scanned marks thereby to generate signals utilized for alignment purposes,

in response to said signals, aligning said electron beam with respect to said wafer,

and selectively irradiating the resist layer with said aligned electron beam to define circuit patterns in said resist layer.

4,407,934

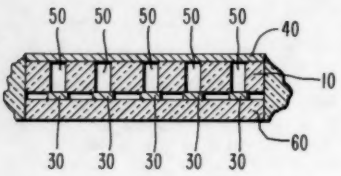
METHOD OF MAKING AN ASSEMBLY OF ELECTRODES

Saul Kuchinsky, Bridgewater, N.J.; Robert H. Bellman, Horseheads, N.Y., and James A. Ogle, Neshanic Station, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 4, 1981, Ser. No. 327,598

Int. Cl.³ G03C 5/00

U.S. Cl. 430—314 **12 Claims**



1. A method for making an electrode assembly comprising the steps of

(a) exposing a plate of photosensitive, electrically insulating glass to ultraviolet radiation to develop a latent image therein in a pattern of parallel strips across a face of said plate, but not extending to the edges thereof;

(b) heat treating said plate at a temperature below the softening point of the glass to develop crystallites in the previously-exposed strip portions which can be selectively chemically removed from said glass plate;

(c) applying an array of first elongated electrodes to one surface of said plate in transverse orientation to said strip portions;

(d) contacting the obverse surface of said plate in at least said strip portions thereof with a solvent to selectively chemically remove said crystallites in said strip portions fully into said plate to form parallel slots therein; and

(e) applying to the obverse surface of said plate having said parallel slots therein a support plate of electrically insulating glass carrying elongated parallel second electrodes, said support plate being oriented in such relation that the second electrodes carried thereby are aligned with and positioned within said slots, said second electrodes being transverse to said first electrodes and in operative relation therewith through said slots.

4,407,935

PHOTOGRAPHIC RECORDING MATERIAL

Mario Fryberg, Praroman-le-Mouret, and David G. Leppard, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 15, 1982, Ser. No. 339,816

Claims priority, application Switzerland, Jan. 20, 1981, 352/81

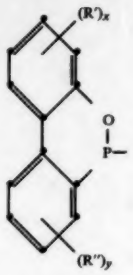
Int. Cl.³ G03C 5/30, 1/06

U.S. Cl. 430—487 **22 Claims**

1. A photographic recording material, which contains at least one development accelerator in at least one silver halide emulsion layer or in a colloid layer adjacent to the silver halide emulsion layer, wherein the development accelerator is of the formula

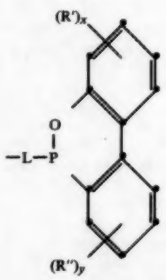
A—R (1)

in which A is a dibenzo[c,e][1,2]oxaphosphorine radical of the formula



(2)

in which R′ and R″ independently of one another are hydrogen, substituted or unsubstituted alkyl having 1 to 4 carbon atoms or halogen, x and y independently of one another are 0, 1, 2 or 3 and R is substituted or unsubstituted amino, substituted or unsubstituted cyclic amino, substituted or unsubstituted aryloxy or a group of the formula



(3)

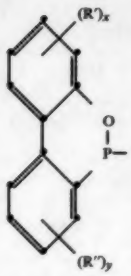
in which L is a radical of the formula =N—Z, with Z being substituted or unsubstituted alkyl or cycloalkyl, or a substituted or unsubstituted 5-membered or 6-membered, saturated or unsaturated ring which contains at least 2 hetero-atoms and which is bonded to the oxaphosphorine radicals via the hetero-atoms, or substituted or unsubstituted aryleneoxy, substituted or unsubstituted oxyaryleneoxy or a radical of the formula $—NB_1—E—NB_2$, in which B_1 and B_2 independently of one another are hydrogen, alkyl or the radical A and E is alkylene or

in which G is —O—, —S— or alkylene, and R′, R″, x and y are as defined above.

22. A developing bath for photographic silver halide recording material, which both contains a silver halide developing agent and a development accelerator in a quantity of 1 to 50 g per mol of silver halide in said photographic silver halide recording material, said development accelerator is of the formula

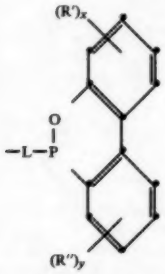
A—R (1)

in which A is a dibenzo[c,e][1,2]oxaphosphorine radical of the formula



(2)

in which R′ and R″ independently of one another are hydrogen, substituted or unsubstituted alkyl having 1 to 4 carbon atoms or halogen, x and y independently of one another are 0, 1, 2 or 3 and R is substituted or unsubstituted amino, substituted or unsubstituted cyclic amino, substituted or unsubstituted aryloxy or a group of the formula



(3)

in which L is a radical of the formula =N—Z, with Z being substituted or unsubstituted alkyl or cycloalkyl, or a substituted or unsubstituted 5-membered or 6-membered, saturated or unsaturated ring which contains at least 2 hetero-atoms and which is bonded to the oxaphosphorine radicals via the hetero-atoms, or substituted or unsubstituted aryleneoxy, substituted or unsubstituted oxyaryleneoxy or a radical of the formula —NB_1—E—NB_2, in which B_1 and B_2 independently of one another are hydrogen, alkyl or the radical A and E is alkylene or

in which G is —O—, —S— or alkylene, and R′, R″, x and y are as defined above.

4,407,936

PROCESS AND MATERIAL FOR FORMING COLOR PHOTOGRAPHIC IMAGE

Seiji Ichijima; Toshiyuki Watanabe; Nobuo Furutachi, and Nobuo Seto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

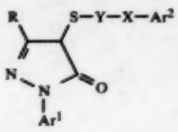
Filed Mar. 12, 1981, Ser. No. 243,159

Claims priority, application Japan, Mar. 12, 1980, 55-31320

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—505 **8 Claims**

1. A color photographic light-sensitive material comprising a support having coated thereon at least one silver halide emulsion layer containing a 5-pyrazolone magenta coupler represented by formula (I)



(I)

wherein R represents an acylamino group, an anilino group or a ureido group; Ar^1 represents a phenyl group which may be substituted with one or more halogen groups, alkyl groups, or alkoxy groups; Ar^2 represents a phenyl group or a naphthyl group, each of which may be substituted with one or more halogen groups, hydroxy groups, carboxy groups, cyano groups, alkyl groups, acylamino groups, carbamoyl groups, ureido groups, sulfonamido groups, diacylamino groups, sulfamoyl groups, alkoxycarbonyl groups, phenyl groups, arylsulfonyl groups or alkoxy groups; X represents oxygen; and Y represents a straight chain or branched chain alkylene group having from 1 to 6 carbon atoms, or an alkylene group containing an ether bond.

4,407,937

SILVER HALIDE PHOTOGRAPHIC SENSITIVE ELEMENT CONTAINING A FLUORINE CONTAINING COMPOUND AS AN ANTISTATIC AGENT

Naohiko Sugimoto; Yukio Maekawa, and Yasunori Ichikawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

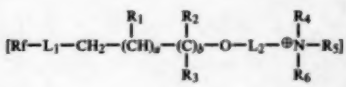
Filed Mar. 4, 1982, Ser. No. 354,677

Claims priority, application Japan, Mar. 4, 1981, 56/30293

Int. Cl.³ G03C *1/78*

U.S. Cl. 430—527 **6 Claims**

1. A light sensitive photographic element having at least a support and a silver halide emulsion layer wherein at least one layer of the element contains an antistatic compound represented by formula (I)



(I)

wherein Rf represents a saturated or unsaturated hydrocarbon group having from 3 to 20 carbon atoms wherein all or a part of the hydrogen atoms are substituted by fluorine atoms, each of L_1 and L_2 represents a divalent linking group, each of R_1, R_2, and R_3 represents a hydrogen atom, a methyl group, or an ethyl group, each of R_4, R_5, and R_6 represents an alkyl group having from 1 to 6 carbon atoms, X represents an anion, and each of a and b represents 0, 1, or 2, and wherein the concentration of the compound represented by formula (I) is at least 0.0001 grams per square meter of the photographic sensitive material.

4,407,938

PHOTOGRAPHIC ELEMENT WITH LACTONE POLYMER

Noboru Mizukura, Tsukui, and Mikio Koyama, Tokorosawa, both of Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Japan

Filed Apr. 19, 1982, Ser. No. 369,362

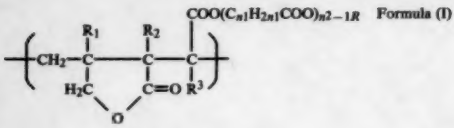
Claims priority, application Japan, Apr. 29, 1981, 56-65445

Int. Cl.³ G03C *1/40, 1/48, 1/78*

U.S. Cl. 430—533 **8 Claims**

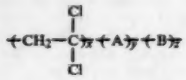
1. A photographic element comprising a support having thereof at least one silver halide emulsion layer and at least one

temporary barrier layer, said temporary barrier layer comprising a mixture of a lactone polymer with repetitive units represented by the formula (I);



Formula (I)

and a vinylidene chloride terpolymer represented by the formula (II);



Formula (II)

wherein R is a hydrogen atom, an alkyl or an aralkyl group; R^1, R^2 and R^3 each is a hydrogen atom or a methyl group; n^1 is an integer of from 1 to 5, while n^2 is an integer of 1 or 2; A is a monomer unit of a copolymerizable ethylenically unsaturated acid or of the salt thereof, while B is a copolymerizable ethylenically unsaturated monomer unit; x represents from 50 to 99.5% by weight, y represents from 0.5 to 44.5% by weight, and z represents from 0 to 49.5% by weight.

4,407,939

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL WITH SUBBING LAYERS

Takashi Naoi; Hiroshi Kawasaki; Jun Yamaguchi; Sumitaka Tatsuta, all of Fujinomiya, and Hidefumi Sera, Minamiashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 2, 1981, Ser. No. 250,331

Claims priority, application Japan, Apr. 2, 1980, 55-43378; Apr. 2, 1980, 55-43379

Int. Cl.³ G03C *1/78, 1/96*

U.S. Cl. 430—536 **17 Claims**

7. A photographic light-sensitive material comprising:

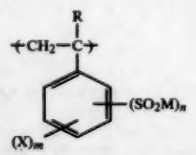
a support;

a subbing layer;

a light-sensitive photographic layer containing an hydrophilic organic colloid and a hardener; and

a layer containing an hydrophilic organic colloid and a polymer having a recurring unit,

said layer being positioned between said subbing layer and said photographic layer, wherein said polymer having a recurring unit contains at least 0.1 mol% of said recurring unit which is represented by the general formula (I), wherein said general formula (I) is:



(I)

wherein R is a hydrogen, an alkyl group having 1 to 6 carbon atoms or a halogen; M is a hydrogen, an alkali metal, an alkaline earth metal or an organic base; X is an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, an alkylamino group having 1 to 6 carbon atoms or a halogen; m is 0, 1 or 2; and n is 1 or 2.

4,407,940

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Shinichi Nakamura, Tokyo; Takashi Kadowaki, Odawara; Mitsuhiro Okumura, Odawara, and Syun Takada, Odawara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

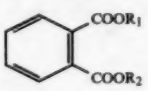
Filed Aug. 16, 1982, Ser. No. 408,487

Claims priority, application Japan, Aug. 24, 1981, 56-133202

Int. Cl.³ G03C *1/10*

U.S. Cl. 430—546 **3 Claims**

1. A silver halide color photographic material which comprises a support, a silver halide emulsion layer provided thereon and a layer provided contiguous to said silver halide emulsion layer, said silver halide emulsion layer containing silver halide crystals of which average crystal size is not greater than 0.9 microns and at least 95% by number of total crystals have crystal sizes falling within ±40% said average crystal size, and at least one of said silver halide emulsion layer and/or said layer contiguous thereto containing a compound represented by the following general formula [I]



[I]

where R_1 and R_2 independently represent an alkyl group having 6 to 12 carbon atoms.

4,407,941

PHOTOGRAPHIC ELEMENT WITH PYRAZOLE ELECTRON DONORS

Shunji Suginaka; Ryuichiro Kobayashi; Satoru Ikeuchi; Noboru Mizukura, and Noriko Fujita, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,464

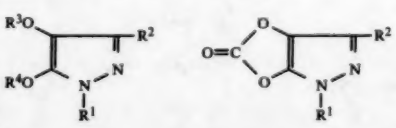
Claims priority, application Japan, Mar. 13, 1981, 56-36162

Int. Cl.³ G03C *1/40, 5/30, 5/54*

U.S. Cl. 430—566 **1 Claim**

1. A photographic element comprising a support provided thereon with at least one light-sensitive silver halide emulsion layer containing a nondiffusible compound which receives at least one electron in an alkaline condition to release a photographically useful material and a nondiffusible electron donor or a precursor thereof having the following formula (I) or (II):

Formula (I) Formula (II)



wherein R^1 represents hydrogen, an alkyl, an aryl or a heterocyclic group, R^2 represents hydrogen, an alkyl, an aryl, a heterocyclic, an amino, a carbamide, a sulfonamide, a sulfamoyl, a carbamoyl or a ureido group, R^3 and R^4 each is hydrogen, $—COR^5$, $—SO_2R^6$ or $—CSR^7$ wherein R^5 and R^6 each is a substituted or unsubstituted, respectively, alkyl, alkenyl, aryl, heterocyclic, alkylamino, arylamino, alkyloxy, aryloxy, alkylthio, arylthio, alkyloxycarbonyl or aryloxycarbonyl group, and R^7 is a substituted or unsubstituted alkylamino or arylamino group, said R^4 being allowed to form a ring together with said R^1.

4,407,942

FLUORESCENT DETECTION OF DNA DAMAGE

Hyman C. Birnboim, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jan. 29, 1981, Ser. No. 229,539
Int. Cl.³ C12Q 1/68, 1/29
U.S. Cl. 435—6 33 Claims

1. A method of measuring the extent of DNA damage in living cells which have been exposed to an actual or potential damaging influence, without purifying the DNA, comprising:

(a) partially lysing the cells under test to render the DNA accessible;

(b) incorporating an alkaline reagent, in sufficient amounts to denature DNA, into at least one sample comprising the cell lysate, and allowing the DNA strand separation to proceed;

(c) at a chosen point of time during the denaturation period when the difference in amounts of double-stranded DNA between damaged and undamaged DNA is large, lowering the pH of each sample to a selected pH sufficiently low to stop the alkaline denaturation, but above that causing any precipitation;

(d) providing that each sample is substantially homogeneous;

(e) adding a fluorescent dye which interacts and fluoresces at the lowered pH with non-denatured double stand DNA but not with single strand DNA or other cell components, to each homogeneous sample of lowered pH containing DNA, denatured DNA and other cell components, and measuring the resulting fluorescence; and

(f) comparing the fluorescence with that of known undamaged DNA subject to the same denaturation, the amount of any decrease in fluorescence being directly proportional to the extent of DNA damage.

4,407,943

IMMOBILIZED ANTIBODY OR ANTIGEN FOR IMMUNOASSAY

Francis X. Cole, Stow, and Deborah M. Van Voorhis, Watertown, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 15,724, Feb. 27, 1979, abandoned, which is a continuation of Ser. No. 924,561, Jul. 14, 1978, abandoned, which is a continuation of Ser. No. 751,099, Dec. 16, 1976, abandoned. This application Mar. 13, 1980, Ser. No. 129,671
Int. Cl.³ G01N 33/54; C12Q 1/04; C12N 11/02
U.S. Cl. 435—7. 6 Claims

1. A method of nonimmunochemically immobilizing two proteins on the internal and external surfaces of a microporous membrane having pore sizes in the range from 25 nanometers to 25 micrometers in its uncoated state, comprising:

coating the internal and external surfaces of the membrane with a protein selected from the group consisting of zein and collagen, to provide a coated membrane that is at least 50% microporous,

immersing the coated membrane in a solution of a biologically active first protein selected from the group consisting of the antigen of and the antibody to *Toxoplasma gondii*, in order to immobilize the first protein, then

immersing the coated membrane having the biologically active first protein immobilized thereon in a solution of an immunochemically neutral second protein selected from the group consisting of fetal calf serum and bovine gamma globulin fraction II, in order to immobilize the second protein while the first protein remains immobilized and retains its biological activity.

4,407,944

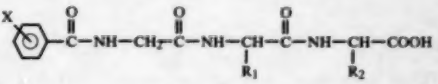
METHOD FOR DETERMINING THE ACTIVITY OF THE ANGIOTENSIN-CONVERTING ENZYME

Yasushi Kasahara, Tama, and Yoshihiro Ashihara, Fuchu, both of Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

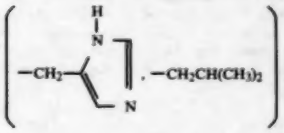
Filed Dec. 14, 1981, Ser. No. 330,110
Claims priority, application Japan, Dec. 23, 1980, 55-181307
The portion of the term of this patent subsequent to Sep. 29, 1998, has been disclaimed.
Int. Cl.³ C12Q 1/34, 1/36
U.S. Cl. 435—18 4 Claims

1. A method for determining the activity of angiotensin-converting enzyme comprising the steps of:

(1) mixing a liquid containing (i) X-hippuryl-L-dipeptide having the formula



wherein X is OH, NH_2 or $N(CH_3)_2$, and wherein the pair of substituents (R_1, R_2) is (a). (H, H_2) or (b).



(ii) hippuricase and (iii) 4-aminoantipyrine, with a liquid containing said angiotensin-converting enzyme to form a reaction mixture;

(2) adding an oxidizing agent to said reaction mixture under reaction conditions effective to form quinonimine dye, and

(3) colorimetrically measuring the concentration of said quinonimine dye.

4,407,945

CONSTITUTIVE PRODUCTION OF INTERLEUKIN 2 BY A T CELL HYBRIDOMA

Steven Gillis, Woodinville, Wash., assignor to Immunex Corporation, Seattle, Wash.

Filed Apr. 29, 1981, Ser. No. 258,804
Int. Cl.³ C12P 21/00, 21/02; C12N 15/00, 5/00; C13R 1/91
U.S. Cl. 435—68 49 Claims

1. A process for constitutively producing murine interleukin-2, comprising:

stimulating murine mononuclear leukocytes in a first culture medium containing a T cell mitogen stimulant;

marking murine neoplastic cells with a sensitizing drug to produce driver cells;

fusing said murine mononuclear leukocyte cells with said driver cells to produce a hybridoma capable of constitutively producing interleukin-2; and

culturing the hybridoma cells in a second culture medium, containing selective suppressing agents which allow only hybrid cells to proliferate.

4,407,946

PROCESS FOR PRODUCING ANTIBIOTIC X-14868A

David P. Labeda, Monsey; John H. E. J. Martin, New City, and Joseph J. Goodman, Spring Valley, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 22, 1981, Ser. No. 313,849

Int. Cl.[3] C12P *19/60, 1/04;* C12R *1/03;* C12N *1/20*

U.S. Cl. 435—75 5 Claims

1. A process for preparing antibiotic X-14868A which comprises aerobically fermenting an antibiotic X-14868A-producing *Actinomadura yumaense* NRRL 125 15 or an antibiotic X-14868A-producing mutant thereof in a liquid medium containing assimilable sources of carbon, nitrogen, and inorganic salts, until substantial antibiotic activity is imparted to the fermentation broth and then recovering the antibiotic therefrom.

4,407,947

PROCESS FOR OBTAINING METAL-FREE CORRINOIDS

Volker Koppenhagen, Braunschweig-Stöckheim, Fed. Rep. of Germany; Gerhard Schlingmann, Berkeley, Calif.; Bernd Dresow, Brunswick; Ludwig Bischoff, Braunschweig-Geitelde; Rosemarie Penkert, Brunswick, and Eicke Siefert, Göttingen, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Biotechnologische Forschung mbH (GBF), Braunschweig-Stöckheim, Fed. Rep. of Germany

Continuation of Ser. No. 127,365, Mar. 4, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 302,022

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908769

Int. Cl.[3] C12P *19/28, 19/42*

U.S. Cl. 435—85 26 Claims

1. A process for obtaining metal-free corrinoids consisting of inoculating a culture media free of added compounds of metals of the VIIIth group of the Periodic Table with from 5% to 25% of a parent culture of a strain of Rhodopseudomas, cultivating under illumination, repeating the steps of inoculating and cultivating employing a fresh culture media free of added compounds of the VIIIth group of the Periodic Table and said illumination employing from 5% to 25% of the culture from the sequentially next preceding stage as an inoculum in each subsequent stage, for a series of several pre-production culture stages, inoculating a fresh culture media free of added compounds of metals of the VIIIth group of the Periodic Table with from 5% to 25% of the sequentially next preceding culture for the last time, cultivating under illumination, separating the microorganism from the culture media of the last culture stage and isolating metal-free corrinoids from the culture media of the last culture stage.

4,407,948

PURIFICATION OF NUCLEOTIDE SEQUENCES SUITABLE FOR EXPRESSION IN BACTERIA

Howard M. Goodman; John Shine, and Peter H. Seeburg, all of San Francisco, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 897,710, Apr. 19, 1978, Pat. No. 4,363,877, and a continuation-in-part of Ser. No. 836,218, Sep. 23, 1977, abandoned. This application Feb. 5, 1982, Ser. No. 346,123

Int. Cl.[3] C12P *19/34;* C12N *15/00*

U.S. Cl. 435—91 9 Claims

1. A method of purifying linear DNA of specific nucleotide sequence containing a restriction site, from an essentially homogeneous length population of DNA molecules, comprising the steps of:

(a) pretreating the DNA to remove any 5′ phosphate end groups,

(b) incubating the DNA with a restriction endonuclease capable of acting on the specific desired nucleotide sequence to produce two linear sub-fragments thereof,

(c) fractionating the sub-fragments according to their length,

(d) isolating the two sub-fragments,

(e) rejoining the sub-fragments covalently, in a DNA ligase catalyzed reaction, to reconstitute the original specific sequence, and

(f) fractionating the rejoined DNA molecules according to their length, whereby the specific sequence is purified from a population of DNA molecules of essentially homogeneous length.

4,407,949

MENINGITIS VACCINE

Peter J. Kniskern; Arpi Hagopian, both of Sayreville, and Dennis J. Carlo, Middlesex, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 189,416, Sep. 22, 1980, Pat. No. 4,307,080, which is a division of Ser. No. 78,430, Sep. 24, 1979, Pat. No. 4,264,764, which is a continuation-in-part of Ser. No. 2,818, Jan. 12, 1979, abandoned. This application Jun. 8, 1981, Ser. No. 271,335

Int. Cl.[3] C12P *19/04;* C12R *1/21*

U.S. Cl. 435—101 9 Claims

1. A process for obtaining a capsular polysaccharide, which is an antigenic and immunogenic capsular polysaccharide from *H. influenza* type b consisting of about equal parts of ribose, ribitol and phosphate, substantially all of the polysaccharide having a molecular weight of at least about 5,000,000, and about half of the polysaccharide having a molecular weight of at least about 10,000,000, comprising:

a. growing a cultures of *H. influenza* in a nutrient medium.

b. removing cell paste from the medium upon completion of the fermentation to produce a remaining liquid,

c. treating the remaining liquid to precipitate unwanted materials,

d. then concentrating the remaining liquid, to produce a concentrated liquid,

e. adding a water-miscible alcohol to the concentrated liquid in concentration effective to precipitate unwanted material without precipitating a substantial quantity of the capsular polysaccharide,

f. extracting the capsular polysaccharide with an aqueous solution of $CaCl_2$,

g. adding a water-miscible alcohol to the extract in concentration effective to precipitate unwanted material without precipitating a substantial quantity of the capsular polysaccharide, and

h. adding an additional quantity of a water-miscible alcohol effective to precipitate substantially all of the capsular polysaccharide.

4,407,950

XANTHOMONAS CAMPESTRIS ATCC 31602 AND PROCESS FOR USE

William P. Weisrock, Tulsa, Okla., and Edward F. McCarthy, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Jul. 14, 1980, Ser. No. 167,869

Int. Cl.[3] C12P *19/06;* C12N *1/20;* C12R *1/64*

U.S. Cl. 435—104 14 Claims

1. A method for the production of a heteropolysaccharide which comprises continuously culturing a degenerative resistant strain of bacteria designated *Xanthomonas campestris* P-107 having the identifying characteristics of ATCC 31602, in an aqueous nutrient medium comprising essentially assimilable sources of carbon, nitrogen, and inorganic substances, wherein said medium is continuously fed to a fermentation zone to produce said polysaccharide, and withdrawing the resulting fermented medium from said zone.

4,407,951

XANTHOMONAS CAMPESTRIS ATCC 31600 AND PROCESS FOR USE

William P. Weisrock, Tulsa, Okla., and Edward F. McCarthy, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 14, 1980, Ser. No. 167,871
Int. Cl.³ C12P *19/06;* C12N *1/20;* C12R *1/64*
U.S. Cl. 435—104 14 Claims

1. A method for the production of a heteropolysaccharide which comprises continuously culturing a degenerative resistant strain of bacteria designated *Xanthomonas campestris* XCP-1, having the identifying characteristics of ATCC 31600, in an aqueous medium comprising the assimilable sources of carbon, nitrogen and inorganic substances wherein said medium is continuously fed to a fermentation zone to produce said polysaccharide, and withdrawing the resulting fermented medium from said zone.

4,407,952

METHOD FOR PRODUCING L-PHENYLALANINE BY FERMENTATION

Takayasu Tsuchida, Kawasaki, Japan, and Konosuke Sano, Madison, Wis., assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 159,477
Claims priority, application Japan, Jun. 15, 1979, 75483
Int. Cl.³ C12N *15/00;* C12P *13/22;* C12R *1/19*
U.S. Cl. 435—108 5 Claims

1. A method for producing L-phenylalanine by fermentation, which comprises:

culturing in a culture medium an L-phenylalanine producing microorganism selected from the group consisting of *Escherichia coli* NRRL B-12141, *Escherichia coli* NRRL B-12145, *Escherichia coli* NRRL B-12146 and *Escherichia coli* NRRL B-12147 constructed by incorporating a hybrid plasmid in a recipient strain of the genus Escherichia and recovering the L-phenylalanine which accumulates in the culture medium, said hybrid plasmid containing a deoxyribonucleic acid fragment possessing genetic information related to L-phenylalanine production and obtained from a phenylalanine analogue resistant mutant of the genus Escherichia.

4,407,953

FERMENTATION PROCESS FOR PRODUCTION OF ALPHA-ISOPROPYLMALIC ACID

John R. DeZeeuw, Stonington, and Irene Stasko, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 24, 1982, Ser. No. 381,595
Int. Cl.³ C12P *7/00;* C12N *15/00, 1/14;* C12R *1/645*
U.S. Cl. 435—145 8 Claims

1. A process for producing alpha-isopropylmalic acid which comprises cultivating *Y. lipolytica* ATCC 20628 in an aqueous nutrient medium having an initial pH of about 6.0–7.0 and containing assimilable sources of carbon, nitrogen, L-leucine and inorganic salts under submerged aerobic fermentation conditions until a substantial amount of alpha-isopropylmalic acid accumulates in the medium.

4,407,954

FIBER FERMENTER

Robert A. Clyde, P.O. Box 983, Asheville, N.C. 28802

Continuation-in-part of Ser. No. 216,310, Dec. 15, 1980, Pat. No. 4,351,905. This application Dec. 7, 1981, Ser. No. 328,125
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ C12P *7/06, 7/02;* C12M *1/40, 1/02*
U.S. Cl. 435—161 20 Claims

1. In a method for allowing the growth of an organism suitable for converting a selected nutrient medium into a selected chemical including the steps of:

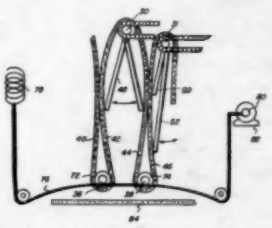
(a) sterilizing, innoculating and incubating the nutrient medium;

(b) incubating the converting organism;

(c) placing the nutrient medium and the converting organism in a container having a substrate supported therein comprising a multiplicity of fibers suitable for supporting the organism, the improvement comprising:

(d) moving one of the converting organism and the nutrient medium relative to the other at a speed which is slightly below the speed at which the converting organism becomes detached from the supporting substrate while maintaining contact between the converting organism and the nutrient medium for a time period sufficient to produce a satisfactory chemical yield.

10. Apparatus for allowing the growth of an organism suitable for converting a selected nutrient medium into a selected chemical comprising:



a container suitable for containing the nurient medium, the container including a port for receiving the nutrient medium, an exhaust port for discharging a flow of excess organisms and a port for removing the selected chemical;

a porous support substrate mounted within the container, the substrate comprising a multiplicity of fibers suitable for supporting the selected organism; and

means for moving one of the support substrate and the nutrient medium relative to the other at a speed slightly below the speed at which the converting organism becomes detached from the support substrate and for maintaining contact between the support substrate and the nutrient medium for a period of time sufficient to produce a satisfactory chemical yield.

4,407,955

FERMENTABLE SUGAR FROM THE HYDROLYSIS OF STARCH DERIVED FROM DRY MILLED CEREAL GRAINS

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,278
The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.
Int. Cl.³ C13K *1/06;* C12P *7/06*
U.S. Cl. 435—161 14 Claims

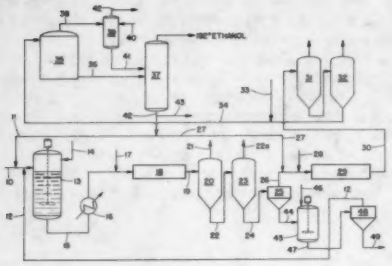
1. A process for converting the starch fraction derived from whole dry milled cereal grain to a sterile aqueous solution of fermentable sugar, said starch containing water insoluble protein and oil, which comprises:

(a) hydrolyzing in a preliminary hydrolysis step an aqueous slurry of the starch in the presence of an acid hydrolysis catalyst at an elevated pressure and temperature to provide a starch hydrolysate slurry containing water insoluble protein and oil and water soluble components;

(b) separating water insoluble protein and oil with or without water soluble components from the hydrolysate resulting from step (a); and,

(c) hydrolyzing in a further hydrolysis step the aqueous

sterile starch hydrolysate slurry resulting from step (a) in the presence of added aqueous water soluble non-fermentable carbohydrate to provide a sterile aqueous solution of fermentable sugar.

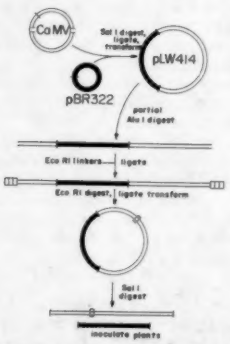


4,407,956

CLONED CAULIFLOWER MOSAIC VIRUS DNA AS A PLANT VEHICLE

Stephen H. Howell, Del Mar, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 13, 1981, Ser. No. 243,330
Int. Cl.[3] C12N *15/00, 5/00, 1/00*
U.S. Cl. 435—172 10 Claims



1. A method for modifying Cauliflower mosaic viral DNA while maintaining the capability of movement, said movement capability comprising replication and systemic infection, which comprises:

combining linear cauliflower mosaic viral DNA with a bacterial cloning vehicle permitting propagation of the resulting hybrid DNA plasmids in an appropriate microorganism host;

cloning said hybrid DNA plasmids in said microorganism to provide a source of said hybrid DNA plasmid;

inserting foreign DNA into said cloned hybrid DNA plasmids at the intergenic region between reading frames VI and I of said Cauliflower mosaic viral DNA to provide a modified Cauliflower mosaic hybrid DNA plasmid containing modified viral DNA, where said intergenic region is non-essential to propagation and movement of said viral DNA;

cloning said modified hybrid DNA plasmids in a microorganism host; and

excising said modified Cauliflower mosaic viral DNA from said hybrid DNA plasmid to provide a plant virus capable of propagation and movement.

4,407,957

REVERSIBLE MICROENCAPSULATION OF A CORE MATERIAL

Franklin Lim, Richmond, Va., assignor to Damon Corporation, Needham Heights, Mass.

Continuation-in-part of Ser. No. 243,584, Mar. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 24,600, Mar. 28, 1979, Pat. No. 4,352,883, which is a continuation-in-part of Ser. No. 953,413, Oct. 23, 1978, abandoned. This application Apr. 28, 1982, Ser. No. 372,836
Int. Cl.[3] C12N *11/10, 11/08, 11/04, 5/02*
U.S. Cl. 435—178 18 Claims

1. A method of encapsulating a core material within a protective environment and of subsequently releasing said core material, said method comprising:

encapsulating said core material by the steps of:

A. placing the core material in an aqueous medium which contains a water-soluble polymer containing anionic groups and having a first charge density;

B. forming the medium into droplets;

C. subjecting the droplets to a solution of multivalent cations to gel the droplets as discrete, shape-retaining, water-insoluble temporary capsules;

D. cross-linking surface layers of said temporary capsules to produce semipermeable membranes about said droplets by subjecting them to a first polymer containing cationic moieties reactive with the anionic groups of said water-soluble polymer;

and releasing said core material by the steps of:

E. exposing the capsules resulting from step D to a solution of monatomic, multivalent cations and a stripping polymer having plural anionic moieties, said stripping polymer having a charge density at least equal to said first charge density;

F. allowing said monatomic cations to compete with said first polymer for anionic groups on the water-soluble polymer and allowing said stripping polymer having plural anionic moieties to compete with said water-soluble polymer for cationic sites on said first polymer; and

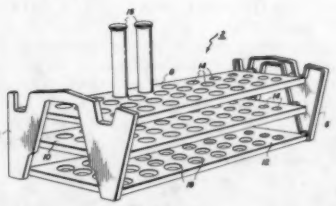
G. sequestering monatomic cations associated with said water-soluble polymer after step F.

4,407,958

SLANT CULTURE TUBE RACK

Harold F. DeGraff, Jr., Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,847
Int. Cl.[3] C12M *1/00*
U.S. Cl. 435—287 3 Claims



1. A culture tube rack for preparation and growth of cultures, including:

a plurality of apertured plates for holding culture tubes in a generally upright position, said plates being mounted between right and left upright end plates,

said end plates each including a front and a rear leg member, said front leg member having a front edge extending upward and forward to a height above the center of gravity of said rack, said rear leg member having a rear edge extending upward and rearward to a height above the center of gravity of said rack,

said end plates being so configured that the front and rear leg members of one of said end plates straddle the corresponding end plate of another such tube rack for positive interlock stacking of a plurality of said racks,

whereby said rack is selectively positionable upright on said front and rear foot portions, or at a first angle of tube slant, or at a second angle of tube slant.

4,407,959

BLOOD SUGAR ANALYZING APPARATUS

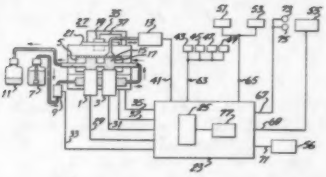
Nobuhiko Tsuji; Keijiroh Nakamura, both of Yokosuka; Koichi Endoh, Hino; Toshiyoshi Hamada, Sekimachi, and Keiichi Ishida, Tokyo, all of Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Oct. 21, 1981, Ser. No. 313,666

Claims priority, application Japan, Oct. 29, 1980, 55-150756; Dec. 9, 1980, 55-172665; Dec. 9, 1980, 55-172666

Int. Cl.³ G01N *35/00, 33/66*

U.S. Cl. 435—288 **3 Claims**



1. A blood sugar analyzing apparatus for analyzing the blood sugar concentration in a blood specimen, comprising:

a reaction cell which houses an enzyme membrane sensor including a fixed enzyme membrane and a measuring electrode, said cell having means for receiving a blood specimen in contact with said sensor to thereby cause a chemical reaction to occur between the specimen and the membrane, and wherein the measuring electrode produces a reaction current in response to the chemical reaction;

means for sampling an output from said sensor at given intervals of time;

means for storing data representing the sampled outputs;

processing means for separating the stored data into new and old data groups, for calculating the average data values of said new and old data groups and for calculating the difference between the average data values, and for determining a background offset portion of the reaction current at a first time point when said difference exceeds a first predetermined value and for determining a steady state level of the reaction current at a second time point, after said first time point, when the difference does not exceed a second predetermined value, and for calculating a blood sugar concentration level of the specimen which is proportional to the difference between the steady state level and the background offset portion of the reaction current.

4,407,960

VISUAL CHEMICAL INDICATING COMPOSITION FOR MONITORING STERILIZATION

Joseph P. Tratnyek, Sudbury, Mass., assignor to American Sterilizer Company, Erie, Pa.

Filed Jun. 25, 1980, Ser. No. 162,811

Int. Cl.³ G01N *21/06;* **C09K** *3/34*

U.S. Cl. 436—1 **11 Claims**

1. A chemical indicating composition for visually monitoring ethylene oxide sterilization comprising:

the reaction product of (i) at least one indicator compound selected from the group consisting of Michler's hydrol, crystal violet lactone, malachite green leuco and crystal violet leuco and (ii) an acidic material selected from the group consisting of acid-earths and diphenolic acids; said reaction product being in the presence of ethylene oxide.

10. A chemical indicating composition for visually monitoring ethylene oxide sterilization comprising:

at least one indicator compound selected from the group consisting of Michler's hydrol, crystal violet lactone, malachite green leuco and crystal violet leuco; and 4,4-bis(4hydroxyphenol)pentanoic acid.

11. A method for visually monitoring ethylene oxide sterilization comprising the steps of:

introducting into a sterilization chamber the reaction product of

(i) at least one indicator compound selected from the group consisting of Michler's hydrol, crystal violet lactone, malachite green leuco and crystal violet leuco, and

(ii) an acidic material selected from the group consisting of acid-earths and diphenolic acids;

contacting said reaction product with ethylene oxide; and

observing the presence or absence of an irreversible color change in said reaction product.

4,407,961

ION-EXCHANGE SYSTEM AND METHOD FOR ISOLATION AND DETERMINATION OF GLYCOSYLATED HEMOGLOBIN IN HUMAN BLOOD

James L. Sanders, 841 N. Zang Blvd., Apt. #236, Dallas, Tex. 75208

Filed Mar. 16, 1981, Ser. No. 244,265

Int. Cl.³ G01N *33/72*

U.S. Cl. 436—67 **3 Claims**

2. A method of separating glycosylated hemoglobin from non-glycosylated hemoglobin and determining the amount of glycosylated hemoglobin in human blood without rigid control of pH and ionic strength and with little temperature dependence comprising the steps of:

preparing a lysate of human blood;

introducing an ion exchange system into said lysate, said ion exchange system including a zwitterionic buffer, said zwitterionic buffer being present in said ion exchange system in a concentration of from about 0.02 to 0.1 molar, said buffer having a pH of from about 6.4 to 7.2 and a pKa of from about 6.6 to about 7.5 at 20° C., said zwitterionic buffer being selected from the group consisting of 3-(N-morpholino) propanesulfonic acid, N-2-acetamidoiminodiacetic acid, N-2-acetamido-2-aminoethane-sulfonic acid, piperazine-N,N'-bis-2-ethanesulfonic acid, N,N-bis-(2-hydroxyethyl)-2-aminoethanesulfonic acid, and 2-[tris-(hydroxymethyl)methyl] aminoethanesulfonic acid, and

a cation exchange resin, said cation exchange resin being present in said ion exchange system in an amount of from about 30 milliequivalents to about 50 milliequivalents of building capacity per liter of ion exchange system;

said cation exchange resin being effective in the presence of said buffer to form a bound fraction of non-glycosylated hemoglobin and an unbound fraction of glycosylated hemoglobin in said lysate; and

analyzing said bound and unbound fractions for hemoglobin.

4,407,962

COMPOSITION FOR THE COLORIMETRIC DETERMINATION OF METALS

Alessandro Tabacco, Siena, and Paolo Tarli, Monteriggioni, both of Italy, assignors to Istituto Sieroterapico E. Vaccinogeno Toscano "Sclavo" S.p.A., Siena, Italy

Filed Dec. 11, 1980, Ser. No. 215,176

Claims priority, application Italy, Feb. 26, 1980, 20177 A/80

Int. Cl.³ G01N *33/48, 33/52*

U.S. Cl. 436—74 **11 Claims**

7. A method for the determination of the iron content of blood serum which comprises:

(a) combining a sample of serum with a chromogenic reagent which comprises a buffer; a soluble salt of a metal selected from the group consisting of the alkali metals and alkaline earth metals; a soluble form of Chromazurol B; and a cationic surface-active agent or a nonionic surface-active agent to form a test sample;

(b) combining a sample of serum with a masking reagent which comprises a buffer, a soluble salt of a metal selected from the group consisting of the alkali metals and alkaline earth metals; a soluble form of Chromazurol B; a cationic surface-active agent or a nonionic surface-active agent; and a complexing agent capable of hindering the formation of a complex between the Chromazurol B and iron to form a blank sample;

(c) combining a standard with the chromogenic agent of step (a) to form a test standard;

(d) combining distilled water with the chromogenic reagent of step (a) to form a blank reagent;

(e) combining the masking reagent of step (b) with the standard to form a masking blank of step (b);

(f) determining the optical density of each of the materials from steps (a), (b), (c), (d), and (e) in a colorimeter;

(g) comparing the optical density of the test sample with the test standard after allowance is taken for the optical density of the blank reagent, the blank sample, and the masking blank to determine the amount of iron that is present.

4,407,963

METHOD FOR DETERMINING THE CONCENTRATION OF AN ABSORBABLE COMPONENT IN A GASEOUS MIXTURE

Ansgar C. H. Sørensen, Anemonevej 4, Allerød DK-3450, Denmark

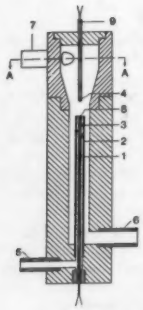
PCT No. PCT/DK80/00072, § 371 Date Jul. 24, 1981, § 102(e) Date Jul. 24, 1981, PCT Pub. No. WO81/01615, PCT Pub. Date Jun. 11, 1981

PCT Filed Nov. 19, 1980, Ser. No. 287,728

Claims priority, application Denmark, Nov. 30, 1979, 5100/79

Int. Cl.³ G01N *31/06*

U.S. Cl. 436—147 **4 Claims**



1. A method of determining the concentration of an absorbable component in a gaseous mixture by subjecting the stream of gaseous mixture to an absorption process in which heat is developed, said method comprising the steps of

providing a vertically oriented tube,

continuously feeding a liquid absorbent upwardly into said tube so as to fill said tube and create a free surface area at its upper end, the liquid absorbent in the free surface area being continuously replenished with fresh liquid absorbent,

causing the gaseous mixture containing the absorbable component to flow in a stream towards and past said free surface area in surface contact therewith such that an amount of absorbable component per unit of time is absorbed from the stream of gaseous mixture into the liquid absorbent at said free surface area,

measuring the temperature in the liquid absorbent at a point just below said free surface area,

measuring the temperature of the stream of gaseous mixture containing the absorbable component at a point adjacent said free surface area but sufficiently distant therefrom that the temperature measurement is not affected by the absorption process taking place at said free surface area,

preheating or precooling the liquid absorbent supplied to said free surface area such that its temperature is substantially equal to the temperature of the liquid absorbent which this will assume when the amount of heat developed therein per unit of time by absorption of absorbable component from the gaseous stream equals the heat lost therefrom per unit of time into the gaseous stream as it flows therepast, in the following referred to as the dynamic equilibrium temperature, and

conducting the method such that the resistance to the absorption in the liquid phase is negligible as compared to that in the gaseous phase and the equilibrium concentration of the absorbable component in the gaseous stream immediately adjacent said free surface area is negligible compared to the concentration in the gaseous stream.

4,407,964

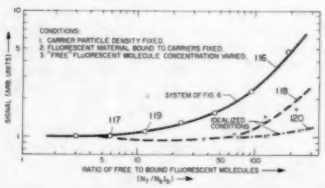
HOMOGENEOUS FLUOROIMMUNOASSAY INVOLVING SENSING RADIATION FOR FORWARD AND BACK DIRECTIONS

Virgil B. Elings, Santa Barbara, and David F. Nicoli, Goleta, both of Calif., assignors to The Regents of The University of California, Berkeley, Calif.

Filed Oct. 7, 1980, Ser. No. 194,856

Int. Cl.³ G01N *33/54, 33/58, 33/52, 21/64*

U.S. Cl. 436—518 **6 Claims**



1. In a fluorescent, homogeneous immunoassay wherein there is provided a reagent comprising in solution carrier particles with antibodies residing at a plurality of sites on each of said carrier particles the improvement comprising:

(a) providing said carrier particles as relatively large particles which are electromagnetically opaque both to an exciting illumination at a first frequency and to a resulting fluorescent output radiation at a second frequency;

(b) illuminating, with optical radiation at a first frequency, the solution resulting from combining the unknown antigen with said reagent and with a fluorescently tagged immuno-active component;

(c) optically sensing output radiation at said second frequency resulting from said fluorescent output radiation, whereby the output radiation from said sample is substantially reduced when said fluorescently tagged component becomes bound to said carrier particle;

said sensing including the steps of (1) sensing fluorescent radiation from the "forward" direction relative to said first frequency radiation, whereby the carrier particles shield or shadow the radiation from the bound fluorescent molecules, and (2) sensing said fluorescent radiation is also in the "back" direction, to obtain full fluorescent radiation from the bound fluorescent molecules; and

(d) comparing the signals sensed in the "forward" and in the "back" directions to determine the relative levels of

bound and free fluorescent molecules, without physically separating the free and bound fluorescent components.

4,407,965

PROCESS FOR PREPARING ANTIBODY

Noboru Yanaihara, Shizuoka, Japan, assignor to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,926

Claims priority, application Japan, May 21, 1980, 55-68040

Int. Cl.³ C07G 7/00; C07C 103/52; G01N 23/00, 33/00

U.S. Cl. 436—547 **8 Claims**

1. A gut glucagon-specific antibody prepared by administering to a mammal an antigen composed of a peptide-carrier complex obtained by

(a) reacting a peptide as a hapten with a carrier in the presence of a binding agent for binding the hapten and the carrier to each other, and

(b) collecting the resulting antibody, wherein the peptide is represented by the general formula:

R-Lys-Arg-Asn-Lys-Asn-Asn-Ile-Ala-OH

wherein R represents a member selected from the group consisting of H, H-Arg-, H-Trp-, H-Asn-, H-Ala, H-Val-, H-Met, H-Leu-, H-Phe-, H-Lys-, H-Thr-, H-Ile-,

H—Cys—,
|
H—Cys—

H-Gly-, H-His-, H-Pro-, H-Cys, H-Gly-Lys-, H-Asn-Tyr-, H-Met-Thr-, H-Met-Asn-, H-Leu-Thr-, H-Trp-Thr-, H-Phe-Val-, H-Gln-Ala-, H-Asp-Arg-, H-Leu-Tyr-, H-Ser-Lys-, H-Met-Asn-Thr-, H-Leu-Met-Asn-Thr-, H-Trp-Leu-Met-Asn-Thr-, H-Gln-Trp-Leu-Met-Asn-Thr-, H-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Arg-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Ser-Arg-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Asp-Ser-Arg-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Tyr-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, H-Lys-Tyr-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-, and H-Ser-Lys-Tyr-Leu-Asp-Ser-Arg-Arg-Ala-Gln-Asp-Phe-Val-Gln-Trp-Leu-Met-Asn-Thr-.

4,407,966

VERY FAST FADING PHOTOCHROMIC GLASS

David J. Kerko, and David L. Morse, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 16, 1982, Ser. No. 418,971

Int. Cl.³ C03C 3/26, 3/08

U.S. Cl. 501—13 **2 Claims**

1. A photochromic glass composition consisting essentially, expressed in terms of weight percent on the oxide basis, with the levels of Ag, Br, Cl, and CuO representing values as analyzed in the glass, of

SiO_2	56–60
Al_2O_3	6–9
B_2O_3	18–21
Li_2O	>2.5–3.5
Na_2O	0.5–2.5
K_2O	5–7
ZrO_2	3.75–5
PbO	0.1–0.15
Ag	>0.15–0.25
Cl	0.2–0.35
Br	0.075–0.15
CuO	0.004–0.02
CeO_2	0–0.5

capable of being chemically strengthened to modulus of rupture values in excess of 35,000 psi with a depth of compression layer of at least 0.030 inch and demonstrating the following photochromic properties when present in cross section of about 1.5–3 mm;

(a) a clear luminous transmittance of approximately 90% when free from added tint;

(b) a darkened luminous transmittance at 40° C. below 35% when the glass is free from added tint and a fading rate at 40° C. such that after five minutes the luminous transmittance will have increased at least 40 percentage units;

(b) a darkened luminous transmittance at 25° C. below 25% when the glass is free from added tint and a fading rate at 25° C. such that after five minutes the luminous transmittance will have increased at least 35 percentage units; and

(c) a darkened luminous transmittance at 0° C. greater than 15%.

4,407,967

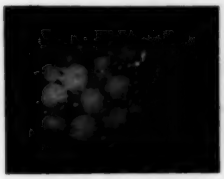
METHOD FOR PRODUCING SPHEROIDAL CERAMICS

Daniel W. Luks, Frenchtown, N.J., assignor to Frenchtown American Corp., Frenchtown, N.J.

Continuation-in-part of Ser. No. 67,201, Aug. 16, 1979, abandoned. This application Mar. 5, 1981, Ser. No. 240,931

Int. Cl.³ C04B 21/06

U.S. Cl. 501—81 **8 Claims**



1. The method of producing spheroidal ceramic particles comprising:

preparing a ceramic slip including particles of a particular composition and known curing temperature;

forming green, spheroidal ceramic particles by spray drying said slip;

firing said green particles at about 100° to 150° C. below the optimum curing temperature to produce spheroidal particles of less than maximum bulk density and to avoid any substantial sintering together of said particles; and

agitating the fired particles to separate particles that have sintered together during firing into individual spheroidal particles.

4,407,968

CERAMIC AL_2O_3 SUBSTOICHIOMETRIC TIC BODY

Minyoung Lee, Schenectady, and Lawrence E. Szala, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 332,903, Dec. 21, 1981. This application Aug. 27, 1982, Ser. No. 412,336

Int. Cl.³ C04B 35/10, 35/56

U.S. Cl. 501—87 **5 Claims**

1. A polycrystalline body consisting essentially of a significantly uniform intermixture of an Al_2O_3 phase and a substoichiometric Ti_1C_x phase where x ranges from about 0.65 to about 0.95, said Ti_1C_x phase ranging from about 20% by

weight to about 40% by weight of said body, and said Al_2O_3 phase ranging from about 80% by weight to about 60% by

weight of said body, said body having a minimum Rockwell A hardness of about 92, said Al_2O_3 phase being a continuous interconnecting network.

4,407,969

FLEXIBLE REFRACTORY COMPOSITION

Joseph Widener, Belvedere, S.C.; James M. Britt, Martinez, Ga., and Steve A. LaPrade, North Augusta, S.C., assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 283,860, Jul. 16, 1981, abandoned. This application Mar. 16, 1982, Ser. No. 357,024

Int. Cl.³ C04B *35/80*

U.S. Cl. 501—95 **10 Claims**

1. A flexible thermally insulative refractory composition suitable for use for the containment of molten material comprising, in approximate percentage by dry weight, 70 to 90% of an inorganic fiber and 10 to 30% of a material selected from the group consisting of asphalt, carbon black, graphite, silicon carbide, and furan resin.

4,407,970

SINTERED BODY OF CERAMICS AND PREPARATION THEREOF

Michiyasu Komatsu; Akihiko Tsuge, and Hiroyasu Ota, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 9, 1982, Ser. No. 406,440

Claims priority, application Japan, Aug. 10, 1981, 56-124102

Int. Cl.³ C04B *35/50, 35/58*

U.S. Cl. 501—97 **12 Claims**

1. A sintered body of ceramics, comprising 0.1 to 10% by weight of yttrium oxide (Y_2O_3); 0.1 to 10% by weight of aluminum oxide (Al_2O_3); 0.1 to 10% by weight of aluminum nitride (AlN); 0.1 to 5% by weight of at least one first oxide selected from the group consisting of lithium oxide (Li_2O), beryllium oxide (BeO), calcium oxide (CaO), vanadium oxide (V_2O_5), manganese oxide (MnO_2), molybdenum oxide (MoO_3) and tungsten oxide (WO_3) or a combination of at least one of these first oxides with at least one second oxide selected from the group consisting of boron oxide (B_2O_3), magnesium oxide (MgO), titanium oxide (TiO_2), chromium oxide (Cr_2O_3), cobalt oxide (CoO), nickel oxide (NiO), zirconium oxide (ZrO_2), niobium oxide (Nb_2O_5), hafnium oxide (HfO_2) and tantalum oxide (Ta_2O_5); and the balance being silicon nitride (Si_3N_4).

4,407,971

SINTERED BODY OF SILICON NITRIDE-BASED CERAMICS

Michiyasu Komatsu; Akihiko Tsuge, and Hiroyasu Ohta, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 26, 1982, Ser. No. 411,982

Claims priority, application Japan, Sep. 1, 1981, 56-136142

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—97 **10 Claims**

1. A sintered body of ceramics having high density, high flexural strength, and high impact resistance, comprising 0.1 to 10% by weight of yttrium oxide (Y_2O_3); 0.1 to 10% by weight of aluminum oxide (Al_2O_3); 0.1 to 10% by weight of aluminum nitride (AlN); 0.1 to 5% by weight of at least one silicide selected from the group consisting of magnesium silicide (Mg_2Si), calcium silicide ($CaSi_2$), titanium silicide ($TiSi_2$), vanadium silicide (VSi_2), chromium silicide ($CrSi_2$), manganese silicide (MnSi), zirconium silicide ($ZrSi_2$), niobium silicide ($NbSi_2$), molybdenum silicide ($MoSi_2$), tantalum silicide ($TaSi_2$), and tungsten silicide (WSi_2); and the balance being silicon nitride (Si_3N_4).

4,407,972

EROSION-RESISTANT REFRACTORY

Bohus Brezny, Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 258,025, Apr. 27, 1981, abandoned. This application Jan. 26, 1983, Ser. No. 461,175

Int. Cl.³ C04B *35/52*

U.S. Cl. 501—99 **20 Claims**

1. A chemically bonded refractory shape having improved resistance to erosion for use in a steel making plant wherein the hot face of the shape is subjected to temperatures of at least about 1600° C. and the cold face is shielded from oxygen penetration, consisting essentially of an anhydrous refractory material, an anhydrous organic binder in an amount sufficient to bond said refractory material, from 0.3% to about 3% finely divided elemental carbon having a particle size ranging from 0.01 to about 1 mm, and from 0.3% to about 3.5% particulate elemental magnesium, based on the total weight of the refractory shape.

4,407,973

METHANOL FROM COAL AND NATURAL GAS

Christiaan P. van Dijk, Houston; Aage Solbakken, Montgomery, and Jerry M. Rovner, Houston, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Jul. 28, 1982, Ser. No. 402,521

Int. Cl.³ C07C *27/06, 31/04*

U.S. Cl. 518—703 **7 Claims**

1. In a process for producing methanol which comprises converting a methane-rich gas by steam reforming into a mixture comprising hydrogen and carbon oxides and reacting said mixture in a first methanol plant which produces a methanol stream and a purge gas stream, the improvement to produce a total capacity of methanol between 1.45 and 1.75 of the design capacity of said first methanol plant comprising:

(a) converting by high temperature partial oxidation using essentially pure oxygen a heavy carbonaceous material into a raw gas comprising hydrogen, carbon monoxide, carbon dioxide, other acid gases and hydrocarbons;

(b) removing said other acid gases and trace elements of sulfur to produce a clean syn-gas; and

(c) reacting said purge gas and said clean syn-gas in a second methanol plant to produce a second methanol stream.

4,407,974

METHOD OF AND APPARATUS FOR CATALYTIC CONVERSION OF GASES

Claus Flockenhaus; Erich Hackler, and Werner Lommerzheim, all of Essen, Fed. Rep. of Germany, assignors to Thyssengas GmbH, Duisburg and Didier Engineering GmbH, Essen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 214,646, Dec. 10, 1980, abandoned, which is a division of Ser. No. 59,522, Jul. 23, 1979, Pat. No. 4,258,006. This application Apr. 23, 1982, Ser. No. 371,265

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1978, 2834589

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—711 **5 Claims**

1. In a method of catalytically converting feed gases comprising hydrogen and carbon monoxide into a mixture contain-

ing hydrocarbon gases under high pressure within an upwardly extending fluidized bed reactor, and including removing by means of an evaporable cooling medium the heat of reaction from said catalytic conversion in the reactor from a reaction zone located in the fluidized bed which zone is elongated in the direction of the flow of the feed gases therethrough from a gas inlet at the lower end to a gas outlet at the upper end of the reaction zone, the improvement comprising that said cooling medium is in the form of feedwater and steam and comprising the steps of introducing pressurized feedwater from a closed space exterior of the reaction zone into the reaction zone at a first location spaced from the inlet end of the reaction zone and flowing the feedwater in indirect heat transfer relation with the gases flowing through the first location in the reaction zone for maintaining the temperature in the first location of the reaction zone approximately 300° K. below the temperature at a second location adjacent the inlet to the reaction zone, and at least partially vaporizing the feedwater in the first location, returning the at least partially vaporized feedwater back to the closed spaced after its passage through the reaction zone, withdrawing the steam in the at least partially vaporized feedwater from the closed space and introducing the steam along with feedwater from a supply source into the reaction zone at the second location adjacent to the inlet end and superheating the steam and feedwter as it flows in indirect heat transfer relation with the gases flowing through the second location of the reaction zone for maintaining the temperature in the second location of the reaction zone approximately 300° K. above the temperature at the first location, removing the superheated steam from the reaction zone and converting said superheated steam into another form of energy at a location spaced from the reactor, reheating the superheated steam, which is partially expanded in said energy conversion, by conveying the partially expanded steam back from the location spaced from the reactor into the reaction zone at a third location within the reaction zone positioned between the second location where superheating takes place and the first location where at least partial vaporization takes place and flowing the partially expanded steam in indirect heat transfer relation with the gases flowing through the reaction zone and then removing said reheated steam from the reaction zone and converting said reheated steam to another form of energy, and conducting a portion of said steam being conveyed to the third location, which has been partially expanded in the course of said energy conversion, into said reaction zone in direct heat transfer with the feed gases flowing through the gas inlet into said reaction zone to form a reaction steam in said catalytic conversion.

4,407,975

POLYMERIC MEMBRANE HAVING MALEIC ANHYDRIDE RESIDUES

Tomohiko Yamaguchi, Yatake, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,863

Claims priority, application Japan, May 22, 1981, 56-77485

Int. Cl.³ B01J *47/12*

U.S. Cl. 521—27 **8 Claims**

1. A polymeric membrane having maleic anhydride residues which comprise a blend of (1) a copolymer of maleic anhydride and an olefin or vinyl monomer and (2) a polyalkyl methacrylate, said blend being partially cross-linked with a bifunctional cross-linking reagent and being prepared by dissolving and mixing said copolymer and polyalkyl methacrylate in an organic solvent together with said bifunctional cross-linking reagent and thereafter removing the organic solvent.

4,407,976

ANIONIC ADSORBENT

Jürg Merz, Therwil; Hans Wegmüller, Riehen, and Rudolf F. Wurster, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 9, 1981, Ser. No. 271,882

Claims priority, application Switzerland, Jun. 16, 1980, 4616/80

Int. Cl.³ C08G *12/00, 69/46*

U.S. Cl. 521—36 **14 Claims**

1. An anionic adsorbent obtained by reaction of

(a) a monomeric compound which contains at least one anionic group and at least one free or methylolated amide group, with

(b) an aminoplast precondensate which is free from salt-forming anionic groups.

4,407,977

FIRE RETARDANT PARTICULATE EXPANDABLE STYRENE POLYMERS

Josef K. Rigler, Recklinghausen; Ekkehard Wienhöfer, Marl; Horst Leithäuser, Marl, and Karl Trukenbrod, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,071

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122341

Int. Cl.³ C08J *9/20, 9/22*

U.S. Cl. 521—56 **6 Claims**

1. In a process for the preparation of shaped bodies based on expanded styrene polymers comprising: the polymerization of styrene or a mixture thereof with at least one monomer copolymerizable therewith in a suspension having an organic phase, the addition of an expanding agent and a fire retardant organic halogen compound, pre-forming of the resulting expandable particles, ageing of the formed particles, and molding thereof in a pressure resistant mold, the improvement comprising:

adding to the polymerization about 0.0001 to 0.1 percent by weight based on said monomers and comonomers of an epoxidation product of an aliphatic hydrocarbon having an epoxidated aliphatic chain containing from 6 to 18 C atoms, said epoxidation product being soluble in said organic phase.

4,407,978

POLYMERIC POLYDONOR COMPLEXONS AND METHOD FOR PREPARATION THEREOF

Jaroslav Kabovec; Zdenek Matejka, and Josef Tomasek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Liberec, Czechoslovakia

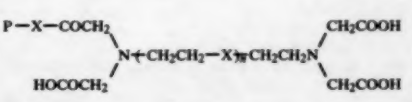
Filed Oct. 29, 1982, Ser. No. 437,619

Claims priority, application Czechoslovakia, Oct. 29, 1981, 7919-81

Int. Cl.³ C08J *9/36*

U.S. Cl. 521—56 **4 Claims**

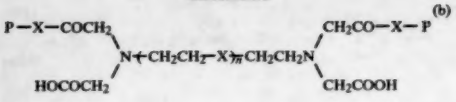
1. Polymeric polydonor complexon having more than six donor sites in a structural unit selected from the group consisting of



(a)

and

-continued



(b)

wherein

P is selected from the group consisting of linear and three-dimensional polymeric skeletons;

X is selected from the group consisting of oxygen and an

group wherein R is selected from the group consisting of hydrogen, and alkyl group of 1–6 carbon atoms, a phenyl group, and a phenyl group substituted with from 1–2 alkyl or alkoxyl groups of 1–6 carbon atoms,

Y is selected from the group consisting of oxygen, sulfur and an N—CH_2COOH group and

n is an integer from 1–3.

4,407,979

PROCESS FOR FORMING FAST-COOL VINYL AROMATIC EXPANDABLE POLYMERS

Adolph V. DiGiulio, Wayne, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 31, 1983, Ser. No. 462,158

Int. Cl.³ C08J 9/18

U.S. Cl. 521—59 10 Claims

1. A process for producing expandable vinyl aromatic polymer particles which exhibit fast-cooling properties in molded products produced therefrom comprising:

polymerizing a vinyl aromatic monomer in which is dissolved about 1.0 to 10.0 percent by weight, based on the vinyl aromatic monomer, of a thermoplastic, branched, block copolymer of 55–95 weight percent of polymerized vinyl aromatic monomer and 5–45 weight percent of polymerized conjugated diene, to form vinyl aromatic polymer particles containing said thermoplastic, branched, block copolymer; and impregnating the vinyl aromatic polymer particles, containing said thermoplastic, branched, block copolymer, with a blowing agent.

4,407,980

CLOSED CELL POLYIMIDE FOAMS AND METHODS OF MAKING SAME

John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 Lexington Pl., El Cajon, Calif. 92021

Filed Sep. 27, 1982, Ser. No. 423,802

Int. Cl.³ C08J 9/22, 9/24, 9/32

U.S. Cl. 521—99 22 Claims

1. A process for producing high temperature and flame resistant closed cell foam which comprises the steps of:

reacting an oxoimine having the general formula:

$$CH_2—(CH_2)_x—NHCO$$

where "X" is a positive integer from 2 to 4, with an aromatic tetracarboxylic acid dianhydride in a mole ratio thereof between about 0.05:1 and 1.5:1 to produce an N-substituted imide;

esterfying said N-substituted imide by mixing therewith a reactive solvent;

adding thereto at least one diamine;

drying the resulting liquid composition;

reducing the dried material to an average particle diameter of from about 0.5 to 10 mm.;

placing a suitable quantity of said particles into a mold; and

heating said particles to a temperature in the range of about 90° to 150° C.;

whereby said particles expand producing a closed cell foam of substantial uniform density throughout the mold.

4,407,981

FLAME RETARDANT MIXTURE FOR POLYURETHANES

Alan M. Aaronson, Fresh Meadows, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 217,967, Dec. 19, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,138

Int. Cl.³ C08G 18/14

U.S. Cl. 521—107 10 Claims

1. A flame-retarded polyurethane composition comprising polyurethane, a two-component flame retardant system consisting of an additive first flame retardant containing dialkyl alkylphosphonate and a second flame retardant containing organochlorine or organobromine incorporated in a polyether polyol.

4,407,982

PROCESS FOR THE MANUFACTURE OF FOAMED STRUCTURES

John M. Elgie, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Filed Feb. 3, 1982, Ser. No. 345,616

Claims priority, application United Kingdom, Feb. 6, 1981, 81003794

Int. Cl.³ C08G 18/14, 18/00

U.S. Cl. 521—122 4 Claims

1. In a process for the production of polyurethane foam in which a first component is admixed and reacted, in the presence of a normally liquid blowing agent, with a second component said first component being an isocyanate, and said second component being a polyol and in which the first component has a viscosity at least two times the viscosity of the second component, the difference in the viscosities being such that but for the improvement hereinafter set forth the resultant polyurethane foam would have nonuniform distribution of cells, the improvement comprising admixing the second component with 1–5%, by weight, of the second component, of fumed silica prior to admixing said first and second components, the amount of silica so admixed being such that the polyurethane foam subsequently obtained has a substantially uniform distribution of cells.

4,407,983

POLYOXAMATE POLYMER/POLYOLS

Richard M. Gerkin, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 29, 1982, Ser. No. 363,102

Int. Cl.³ C08G 18/14

U.S. Cl. 521—128 19 Claims

1. A polymer/polyol dispersion comprising a polyoxamate polymer dispersed in a polyhydroxyl containing medium wherein said polyhydroxyl containing medium has a molecular weight of from 250 to 14,000.

4,407,984

DENTAL COMPOSITIONS

Maurice J. Ratcliffe, and Thomas A. Roberts, both of Congleton, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 13, 1981, Ser. No. 321,225

Claims priority, application United Kingdom, Dec. 3, 1980, 8038805; Jul. 9, 1981, 8121235

Int. Cl.³ C08L 35/02

U.S. Cl. 523—115 17 Claims

1. A fluid dental composition which comprises

(a) liquid ethylenically unsaturated polymerisable resin suitable for dental applications (A)

(b) a mixture of fillers (B) in volume fraction from 60% to 85% where volume fraction is expressed as

$$\left(\frac{\text{volume } B \times 100}{\text{volume } A + \text{volume } B}\right)$$

said mixture of fillers comprising fine particle size filler and large particle size filler, the fine particle size filler being hydrophilic and having a mean size value in the longest direction of less than 0.1 μm and being present in volume fraction from 10% to 55% where volume fraction is expressed as

$$\left(\frac{\text{volume fine} \times 100}{\text{volume } A + \text{volume fine}}\right),$$

and the large particle filler having mean size value in the longest dimension of 0.5 μm to 80 μm,

(c) polymerisation catalyst for the liquid polymerisable resin, and

(d) dispersing agent.

4,407,985

METHOD OF MAKING AND IMPROVED COMPOSITIONS FOR AN INITIALLY ERASABLE INK FOR A BALL POINT WRITING INSTRUMENT

Frank A. Muller, Los Angeles, Calif., assignor to Scripto, Inc., Doraville, Ga.

Filed May 5, 1982, Ser. No. 374,938

Int. Cl.³ C09D *11/18*; B41K *7/00*; B43K *7/10*; C08K *5/01*

U.S. Cl. 523—161 **13 Claims**

1. In a ball point writing instrument containing an ink capable of depositing a trace on an absorbent, paper-like writing surface having minute voids therein, said trace being characterized by initial erasability thereof by ordinary pencil erasers and the capability of developing permanence over a period of time, said ink comprising pigment, a polar elastomer, said polar elastomer having a selected molecular weight range of about 90,000 to 1,000,000 and a selected Mooney viscosity range of about 15 to 60 and requiring no mastication for use in said ink, and a solvent system, said solvent system comprising a volatile component having a boiling point less than about 180° C. and an essentially non-volatile component which includes pigment vehicle having a boiling point greater than about 300° C. and low viscosity plasticizer having a boiling point greater than 180° C. but less than 300° C., the solvent system being present in amount sufficient to impart a final ink viscosity in the range of about 1.5 million cps.

4,407,986

POLYPROPYLENE COMPOSITION

Manabu Nomura; Norio Sugi; Takayoshi Tanaka, and Koichi Hara, all of Sodegaura, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 235,513, Feb. 18, 1981, abandoned. This application Jun. 14, 1982, Ser. No. 388,206

Claims priority, application Japan, Feb. 29, 1980, 55-24004

Int. Cl.³ C08K *3/26*

U.S. Cl. 523—200 **9 Claims**

1. A polypropylene composition comprising 60 to 90% by weight of crystalline polypropylene selected from the group consisting of (a) block copolymer of propylene and ethylene or butene-1 having a melt index of from 0.1 to 8, (b) random copolymer of propylene and ethylene or butene-1 having a melt index of from 0.1 to 10 and (c) propylene homopolymer having a melt index of from 0.1 to 5 and 40 to 10% by weight of precipitated calcium carbonate which had been subjected to a surface-treatment by the use of a dispersant selected from the group consisting of (a) stearic acid and its metal salts and (b) palmitic acid and its metal salts and has an average particle diameter of from 0.1 to 0.3μ and the standard deviation value of particle diameter of said calcium carbonate is 0.05μ or less.

4,407,987

POLYMERIC RESINS AND BLENDS WITH HIGH PACKING DENSITIES

Zenas Crocker, Westmount, and David V. Wise, St. Bruno, both of Canada, assignors to Synergistics Chemicals Limited, Quebec, Canada

Filed Oct. 27, 1981, Ser. No. 315,370

Int. Cl.³ C08J *3/02*

U.S. Cl. 523—322 **10 Claims**

1. In a process for the manufacture of a particulate polymeric resin blend suitable for forming plastic articles in which a particulate composition comprising a thermoplastic polymeric resin is mixed and thermokinetically heated in a high intensity mixer having a plurality of blades attached to arms rotating with a blade tip speed of at least about 25 meters per second to effect blending of the composition and heating thereof to an elevated temperature below commencement of agglomeration of the particulate composition, and in which the blended and heated particulate composition is cooled in a mixer to a temperature at which the particulate composition can be stored without agglomeration, the improvement wherein the blend and heated particulate composition is cooled in a high intensity mixer with blades attached to arms rotating in said mixer, said arms being rotated at a blade tip speed of not more than 16 meters per second whereby the particulate cooled polymeric resin blend has a high packing density.

4,407,988

METHOD FOR PREPARING A WEAR-RESISTANT COMPOSITION CONTAINING FLUORINATED GRAPHITE, GRAPHITE FIBERS AND PTFE

Louis Abrahams, Worcester, and Thomas P. J. Izod, Holliston, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Division of Ser. No. 181,909, Aug. 27, 1980, Pat. No. 4,342,679. This application Mar. 25, 1982, Ser. No. 361,700

Int. Cl.³ C08K *7/02, 3/04*

U.S. Cl. 523—334 **12 Claims**

1. The method of preparing a composition consisting essentially of a mixture of 74–84% by weight polytetrafluoroethylene, 7–17% graphite fibers and 4–14% fluorinated graphite comprising the steps of:

mixing together 74–84 parts by weight of polytetrafluoroethylene in a chlorinated ethane or methane solvent to form a first slurry,

mixing 7–17 parts graphite fibers and 4–14 parts fluorinated graphite in a chlorinated ethane or methane solvent to form a second slurry,

mixing said first and second slurries to form a third slurry, and

draining said third slurry so as to give the mixture a granular consistency.

4,407,989

PROCESS FOR THE SEPARATION TREATMENT OF POLYMER FROM POLYMER SOLUTION

Hiroyoshi Takao, Chiba, and Yoshio Inoue, Ichihara, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 16, 1982, Ser. No. 348,772

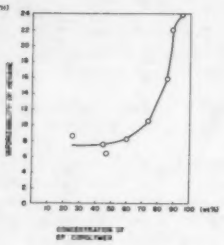
Claims priority, application Japan, Feb. 23, 1981, 56-25753; May 25, 1981, 56-79872

Int. Cl.³ C08J *9/28*

U.S. Cl. 523—340 **10 Claims**

1. In a process for the separation treatment of a polymer

solution, the improvement in separating and recovering polymer and polymerization solvent by flashing a polymer solution, which comprises heating said polymer solution under an elevated pressure sufficient to maintain said solution in a liquid state, sending said solution into a flashing tank kept at an inner surface temperature of 140° C. or above and a pressure ranging



from ordinary pressure to 5 kg/cm^2 G, flashing said solution to evaporate and separate the solvent, thereby concentrating said solution so that concentration of the polymer in said solution becomes 80% by weight or more, and recovering the concentrated solution from the bottom part of the flashing tank.

4,407,990

ACRYLIC COATING COMPOSITIONS

Derrard M. Hall, Glen Waverley; Roy A. Kemp, Ferntglen, and Christopher H. Such, Mount Eliza, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Feb. 11, 1982, Ser. No. 348,088

Claims priority, application Australia, Feb. 13, 1981, PE7589

Int. Cl.^{3} C08L *1/14*

U.S. Cl. 524—38 **4 Claims**

1. A liquid coating composition comprising a mixture of

(a) a solution in volatile organic liquid of a copolymer of from 75–90% methyl methacrylate, 1.5–4.0% dimethyl aminoethyl methacrylate and 8–23.5% of monomer selected from butyl methacrylate, butyl acrylate and lauryl methacrylate, which copolymer shall have a glass transition temperature of 80°–95° C.;

(b) a solution in volatile organic liquid of cellulose acetate butyrate which has a viscosity of 0.5–5.0 sec when measured according to Test Method D1343 of the American Society for Testing and Materials, and a hydroxyl value of 2 maximum; and

(c) a monomeric ester plasticiser compatible with the selected mixture of the said components (a) plus (b)

such that the non-volatile constituents of (a), (b) and (c) comprise respectively 43.5–64.0%, 15.0–25.5% and 21.0–31.5% of the total weight of non-volatile material of (a) plus (b) plus (c).

4,407,991

OXALIC ACID STABILIZED THERMOSETTABLE VINYL ESTER RESINS

Virginia B. Messick, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 265,473, May 20, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 426,413

Int. Cl.^{3} C08K *5/47, 5/09*

U.S. Cl. 524—83 **13 Claims**

1. A thermosettable resin composition having improved storage stability, said composition comprising a vinyl ester resin and a stabilizing amount of oxalic acid.

12. The composition of claim 1 wherein the oxalic acid is present together with phenothiazine.

4,407,992

FLAME RETARDANT COMPOSITIONS BASED ON ALKYLENE-ALKYL ACRYLATE COPOLYMERS

Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 127,509, Mar. 5, 1980, abandoned, and Ser. No. 192,356, Sep. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 944,336, Sep. 21, 1978, Pat. No. 4,243,579. This application Aug. 30, 1982, Ser. No. 411,561

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.^{3} C08K *5/54, 3/22, 3/26, 3/30*

U.S. Cl. 524—94 **27 Claims**

1. A flame retardant composition comprising an alkylene-alkyl acrylate copolymer, from about one to about 30 percent by weight of a halogenated flame retardant additive, from about 0.5 to about 50 percent by weight of an oxide, carbonate, hydroxide or sulfate of magnesium or calcium and from about 0.5 to about 15 percent by weight of antimony oxide.

4,407,993

HINDERED PIPERIDINE POLYMER STABILIZERS

Hans Hinsken, Kandern, Fed. Rep. of Germany; Wolfgang Mueller, Allschwil, Switzerland, and Hermann Schneider, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

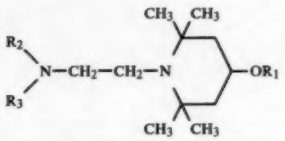
Filed Mar. 15, 1982, Ser. No. 357,886

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110969

Int. Cl.^{3} C08K *5/34;* C07D *211/44;* C08K *5/35*

U.S. Cl. 524—96 **13 Claims**

1. A compound of formula I



I

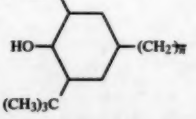
in which R_1 is hydrogen or a group

(a)

in which

X is a direct bond, —O— or —NH—; and

R_4 is C_{1-18}alkyl, C_{5-8}cycloalkyl, phenyl (C_{1-4}) alkyl, phenyl, phenyl substituted with 1 or 2 C_{1-12}alkyl groups having together no more than 18 carbon atoms, or the group



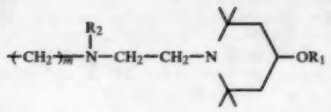
(c)

in which n=0, 1 or 2, or, when X is —NH—, R_4 may also be C_{1-18}alkyl monosubstituted by isocyanate

R_2 is hydrogen, C_{1-18}alkyl or a group (a); and

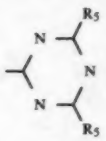
R_3 is hydrogen, C_{1-18}alkyl or a group (b), (c) or (d)

(b)



in which m is 2-10 and R_1 and R_2 are as defined above,

(c)



in which each R_5 independently is chlorine;

(f)

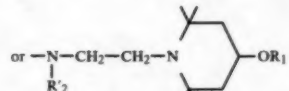
in which

R_7 is hydrogen, C_{1-18}alkyl or β-hydroxyethyl and

R_8 is C_{1-18}alkyl, β-hydroxyethyl or phenyl or

R_7 and R_8 together with the nitrogen atom to which they are attached form a piperidine or morpholine ring;

(g)

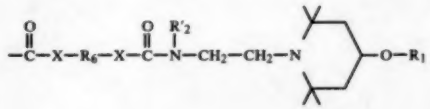


in which

R_2' is hydrogen or C_{1-18}alkyl and

R_1 is as defined above;

(d)



in which

X, R_1 and R_2' are as defined above, and

R_6 is C_{2-10}alkylene, phenylene, phenylene mono- or di-substituted by C_{1-9}alkyl, or, when X is a direct bond, R_6 may also be $—CH_2—$ or a direct bond,

provided that, when R_3 is a group (c) or (d) then R_2 is R_2'; or R_2 and R_3, together with the nitrogen atom to which they are attached, form a succinimide, maleimide or phthalimide ring.

6. A process for the stabilization of polymeric materials against the effect of light comprising the incorporation of from 0.01 to 5% by weight of a compound of claim **1**, into the polymeric material to be stabilized.

4,407,994

AQUEOUS SIZING COMPOSITION COMPRISING KETENE DIMER AND EPIHALOHYDRIN/POLYAMINO POLYAMIDE/BIS(HEXAMETHYLENE)TRIAMINE REACTION PRODUCT

Ralph A. Bankert, New Castle, and David H. Dumas, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Jul. 2, 1981, Ser. No. 279,914

Int. Cl.[3] **C08L** *77/06;* **C08G** *69/48*

U.S. Cl. 524—107 **2 Claims**

1. An aqueous ketene dimer emulsion consisting essentially of, by weight, (I) from about 3 to about 30 parts solids and (II) from about 97 to about 70 parts water, the total of (I) and (II) being 100 parts, the solids (I) consisting essentially of, by weight, (a) from about 1 part to about 12 parts ketene dimer, (b) from about 1 part to about 25 parts water-soluble resinous reaction product, and (c) from about 1 part to about 25 parts of an emulsifier, the amounts of (a), (b) and (c) being selected so that the total weight thereof will be in the range of 3 to 30 parts, said component (b) being a water-soluble resinous reaction product derived by reaction of (i) an epihalohydrin, (ii) a water-soluble polyaminopolyamide resin, and (iii) a composition comprised of from about 20% to about 65% by weight of bis(hexamethylene)triamine wherein (iii) is used in an amount of from about 2 to 10 parts by weight for each part by weight of (ii) and (i) is used in an amount of from about 0.5 mole to about 1.5 moles for each basic amino group present in (ii) and (iii), said component (iii) being in the residue obtained after recovery of hexamethylenediamine from its manufacture by hydrogenation of adiponitrile and said component (ii) being derived by reaction of a dicarboxylic acid and a polyalkylenepolyamine in a mole ratio of amine to acid of from about 0.8:1 to about 1.4:1.

4,407,995

STABILIZED POLYCARBONATE COMPOSITIONS CONTAINING CYCLIC CARBONATES AND ORGANOPHOSPHOROUS COMPOUNDS

Kevin F. Dick, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1982, Ser. No. 402,497

Int. Cl.[3] **C08K** *5/15, 5/52, 5/53*

U.S. Cl. 524—108 **9 Claims**

1. A heat stabilized aromatic polycarbonate composition resistant to yellowing which comprises an aromatic polycarbonate blended with 100 to 10,000 parts per million of a cyclic carbonate compound having a boiling point greater than about 250° C. and 100 to 10,000 parts per million of an organophosphorous compound selected from neutral phosphites and phosphonites.

4,407,996

STABILIZED POLYCARBONATE COMPOSITIONS

Stephen M. Cooper; Sheldon J. Shafer, both of Pittsfield, Mass., and John A. Tyrell, Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 26, 1981, Ser. No. 296,336

Int. Cl.[3] **C08K** *5/41;* **C08L** *69/00*

U.S. Cl. 524—167 **7 Claims**

1. A composition which comprises an aromatic carbonate polymer in admixture with an effective amount of a stabilizer of the group consisting of

(a) thermally stabilizing compound of the formula

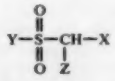


Figure 1

wherein

X is phenyl or phenyl substituted with one to three members

of the group consisting of alkyl of one to three carbon atoms, inclusive, alkoxy of one to three carbon atoms, inclusive, chlorine and bromine;

Y is alkyl of one to six carbon atoms, inclusive; phenyl substituted alkyl of one to six carbon atoms, inclusive, the phenyl unsubstituted or substituted with one to three members of the group consisting of alkyl of one to three carbon atoms, inclusive, alkoxy of one to three carbon atoms, inclusive, chlorine and bromine; phenyl; and phenyl substituted with one to three members of the group consisting of alkyl of one to three carbon atoms, inclusive, alkoxy of one to three carbon atoms, inclusive, chlorine and bromine;

Z is hydrogen; alkyl of one to six carbon atoms, inclusive; phenyl; or phenyl substituted with one to three members consisting of the group of alkyl of one to three carbon atoms, inclusive, alkoxy of one to three carbon atoms, inclusive, chlorine and bromine;

(b) a thermally stabilizing polymer having as a repeating unit a sulfonyl group with a C—H bond alpha to the sulfonyl group and a phenyl is attached to the said C—H bond.

4,407,997

MARINE PAINT

Cristian M. Sghibartz, Washington, England, assignor to The International Paint Company Limited, London, England

Filed Oct. 21, 1981, Ser. No. 313,290

Claims priority, application United Kingdom, Oct. 30, 1980, 8034798

Int. Cl.³ C08L *31/02*

U.S. Cl. 524—202 **10 Claims**

1. A marine paint comprising a film-forming acrylic polymer and a metalliferous pigment which is sparingly soluble in seawater, in which the acrylic polymer comprises 20 to 70 percent by weight of monomer units (A) selected from methyl acrylate and ethyl acrylate, 10 to 45 percent by weight of monomer units (B) of a triorganotin salts of an olefinically unsaturated carboxylic acid, and 20 to 50 percent by weight of units (C) which are alkyl methacrylate units having 1 to 4 carbon atoms in the alkyl group or styrene units, provided that if the acrylic polymer is prepared by emulsion polymerisation it contains no more than 40 percent by weight of monomer units (C), the monomer units (A), (B) and (C) forming at least 80 percent by weight of the polymer and the balance of the polymer if any being units of at least one other olefinically unsaturated comonomer.

4,407,998

HIGH IMPACT POLYPROPYLENE RESIN

Ilan Duvdevani, Leonia, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 222,371, Jan. 5, 1981, abandoned. This application Aug. 12, 1981, Ser. No. 292,298

Int. Cl.³ C08G *23/12;* **C08K** *5/09, 5/20*

U.S. Cl. 524—229 **8 Claims**

1. A polypropylene resin which consists essentially of a blend of:

(a) an isotactic polypropylene homopolymer having an $\overline{M}_n$ as measured by GPC of at least about 15,000;

(b) about 5 to about 15 parts by weight of a zinc neutralized sulfonated EPDM terpolymer per 100 parts by weight of said isotactic polypropylene homopolymer; and

(d) about 5 to about 15 parts by weight of a high molecular weight polypropylene per 100 parts by weight of said isotactic polypropylene resin, said high molecular weight polypropylene having an $\overline{M}_n$ of about 80,000.

4,407,999

WATER REPELLENT ADHESIVE COMPOSITION FOR WOODEN MATERIAL

Takeshi Fushiki, Yokohama; Tohru Tagawa, Machida, and Satoru Kawakami, Urawa, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,037

Claims priority, application Japan, Feb. 25, 1980, 55-22522

Int. Cl.³ C08L *91/06*

U.S. Cl. 524—276 **18 Claims**

1. A water-repellent adhesive composition for wooden materials, which consists essentially of:

(1) a paraffin emulsion comprising a paraffin hydrocarbon component which does not evaporate and scatter during hot pressing of wooden material to which the adhesive composition has been applied and an oxidized paraffin component; and

(2) a resin material selected from the group consisting of urea resins, urea-melamine resins and phenol resins.

4,408,000

COMPOSITIONS COMPRISING THERMOPLASTIC RESIN, MOLD RELEASE AGENT AND LONG CHAINED FATTY ACID

Garland G. Lee, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 273,589, Jun. 15, 1981. This application Dec. 7, 1981, Ser. No. 327,947

Int. Cl.³ C08K *5/09, 5/10;* **C08L** *69/00, 91/06*

U.S. Cl. 524—315 **18 Claims**

1. A composition which comprises a thermoplastic resin selected from the group consisting of aromatic polycarbonates, polyesters, polysulfones, polyethersulfones, polyamides, polysulfides, polyacrylates, acrylonitrile butadiene styrene, butadiene styrene, methacrylate butadiene and blends thereof and a mold release effective amount of a mold release agent and a mold release enhancing effective amount of a saturated or unsaturated normal fatty acid having from about fourteen (14) to about thirty-six (36) carbon atoms, inclusive which is insufficient to cause appreciable degradation of the polymer during normal processing and use.

4,408,001

DEGENERATION INHIBITED SANITIZING COMPLEXES

Sally P. Ginter, Sanford, and Percy J. Hamlin, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

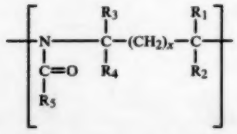
Filed Apr. 6, 1981, Ser. No. 251,626

Int. Cl.³ C08L *79/04*

U.S. Cl. 524—376 **18 Claims**

1. A composition comprising:

(a) a polymer containing a characterizing amount of units of the formula



(I)

wherein R_1–R_4 are independently hydrogen, methyl or ethyl and wherein R_5 is hydrogen or an alkyl radical containing 1 to 3 carbon atoms and x is 0 or 1;

(b) $IBrCl^-$, IBr_2^-, $BrCl_2^-$ or mixtures thereof;

(c) a cation selected from the group consisting of alkali metal ions, alkaline earth metal ions, hydrogen ion, ammonium ion and mixtures thereof; said cation being obtained from a source independent of the polymer;

(d) water; and

(e) a degeneration inhibiting amount of an alcohol of the formula:

$$R-(OCH_2CH_2)_n-OH$$

wherein R is methyl, ethyl or 2-hydroxyethyl and n is a number from 0 to 3.

4,408,002

STABILIZATION OF ZINC-CONTAINING COATING COMPOSITIONS

Paul E. Wills, Berwyn, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 220,996, Dec. 29, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,704

Int. Cl.³ C08L *23/36*

U.S. Cl. 524—357 **4 Claims**

1. An iminated acrylate coating composition containing zinc which contains also an amount of acetyl acetone effective to chelate with the zinc and prevent gelation of the composition upon standing.

4,408,003

VARNISHES FOR GLASSCLOTH LAMINATES, METHODS OF THEIR PRODUCTION AND LAMINATES MADE THEREFROM

Joseph G. Robinson, Winchcombe, and Sally A. Brain, Evesham, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 15, 1981, Ser. No. 311,647

Claims priority, application United Kingdom, Nov. 7, 1980, 8035809

Int. Cl.³ C08K *5/07*

U.S. Cl. 524—364 **5 Claims**

1. A varnish for the preparation of glasscloth laminates, comprising a mixture of:

a solution of 100 parts of a TFP resin having a number average molecular weight of about 1000 and an oxygen content of about 8% dissolved in a solvent selected from the group consisting of C_4 to C_6 alkanones and C_3 or C_4 alkanols; and

a solution of from 8 to 12 parts of hexamine dissolved in a minimum amount of a solvent comprising water and a lower alkanol in a ratio of about 3:5.

4,408,004

HIGH CLARITY, LOW HAZE POLYESTERS HAVING REDUCED INFRARED HEAT-UP TIMES

Brian W. Pengilly, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 24, 1982, Ser. No. 351,841

Int. Cl.³ C08L *67/02;* **C08K** *3/04*

U.S. Cl. 524—398 **19 Claims**

1. A high clarity, low haze polyester comprising:

a polyester, said polyester having a small amount of an infrared absorbing material wherein said infrared absorbing material is carbon black, wherein the amount of said carbon black is present from 0.1 to 10 parts by weight per million parts by weight of said polyester, wherein said carbon black has an average particle size of from 10 to 500 nanometers and wherein said polyester has a Hunter "a" coordinate value of from minus 1 to 1 and a Hunter coordinate "b" value of from minus 2 to 2.0 and a Hunter haze value of less than 3.0

4,408,005

FLAME RETARDANT POLYCARBONATES

Joseph B. Byrne, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1982, Ser. No. 360,712

Int. Cl.³ C08K *3/30*

U.S. Cl. 524—421 **6 Claims**

1. A flame retardant thermoplastic composition comprising an aromatic polycarbonate and an amount of an alkali metal hydrogen sulfite effective to retard flaming.

4,408,006

STAR ELASTOMERS IN FOOTWEAR COMPOUNDS

Ralph Milkovich, Paoli, and David R. Warfel, Exton, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 73,393, Sep. 7, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,699

Int. Cl.³ C08L *9/06, 47/00*

U.S. Cl. 524—534 **4 Claims**

1. A composition useful as a shoe-sole compound consisting of:

(a) 100 parts by weight of thermoplastic elastomer of 25 to 55% by weight of a monovinyl aromatic monomer and 45 to 75% by weight of a conjugated diene monomer of 4 to 8 carbon atoms, which elastomer has an average general formula $(A\text{-}B)_{\overline{m}}X$ where A is a non-elastomer polymer block based on the monovinyl aromatic monomer and having a number average molecular weight of from 10,000 to 35,000; B is an elastomeric polymer block based on the conjugated diene monomer and having a number average molecular weight of from 11,000 to 85,000; m is an integer between 7 and 12, and X is the radical of a polyfunctional coupling agent selected from o-divinylbenzene, m-divinylbenzene, p-divinylbenzene, and mixtures thereof;

(b) about 80–250 parts by weight of a naphthenic extender oil;

(c) about 40–150 parts by weight of a polystyrene material;

(d) about 0–80 parts by weight of a finely divided filler; and

(e) about 0–5.0 parts by weight of stabilizers.

4,408,007

FREE-FLOWING SINTERING POWDERS WHICH HAVE IMPROVED PROPERTIES AND ARE BASED ON TETRAFLUOROETHYLENE POLYMERS AND A PROCESS FOR THEIR MANUFACTURE

Jürgen Kuhls, and Robert Hartwimmer, both of Burghausen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 214,465, Dec. 8, 1980, Pat. No. 4,368,296. This application Sep. 13, 1982, Ser. No. 417,122

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949908

Int. Cl.³ C08J *3/12;* **C08F** *214/26, 114/26*

U.S. Cl. 524—546 **4 Claims**

1. Process for the manufacture of a sinterable polymer powder which optionally contains a filler and is based on a polymer which has been obtained by polymerization in an aqueous medium in the presence of 0.01 to 0.5% by weight, relative to the aqueous medium, of at least one fluorinated dispersing agent inactive as telogen with formation of a colloidal dispersion of polymer particles of an average size of 0.05 to 0.8 μm and a total solids content of 10 to 50% by weight, relative to the dispersion, and which contains 98.5 to 100% by weight of polymerized tetrafluoroethylene units and 1.5 to 0% by weight of polymerized units of at least one perfluorinated monomer in which one fluorine atom can be replaced by chlorine and which is copolymerizable with tetrafluoroethylene, the polymer dispersion being adjusted to a solids content of about 5 to 15% by weight and being stirred at 10° to 85° C. at an energy of 4 to about 200 $J.s^{-1}.l^{-1}$ and an organic liquid being added, after which, if appropriate, the filler is added and, after the

formation of granules, the product is washed, finally separated from the liquid phase and dried, and, prior to the addition of said organic liquid, stirring the dispersion until an adequate degree of thickening of the dispersion is obtained, indicated by a clearly visible optical inhomogeneity, while adding 0 to 2% by weight, relative to the dispersion, of at least one water-soluble, dissociating, inorganic salt which contains an ammonium cation or a metal cation, and/or a water-soluble acid by means of which the pH of the dispersion is adjusted to 0 to 6, and then adding 0 to 10 minutes later, without intermediately separating, drying and grinding the polymer, 1 to 5% by weight, relative to the dispersion, of an organic liquid which readily wets the polymer particles present in the dispersion and which is soluble to the extent of less than 15% by weight in water at 20° C., to the dispersion.

4,408,008

STABLE, COLLOIDAL, AQUEOUS DISPERSIONS OF CROSS-LINKED UREA-URETHANE POLYMERS AND THEIR METHOD OF PRODUCTION

Peter Markusch, McMurray, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 24, 1981, Ser. No. 286,493
Int. Cl.³ C08L *75/10, 75/02*
U.S. Cl. 524—591 **69 Claims**

1. A process for the preparation of a stable, colloidal, aqueous dispersion of cross-linked urea-urethanes which comprises

(a) forming a substantially linear, isocyanate-terminated prepolymer having a molecular weight of up to about 25,000 by reacting

(i) an organic polyisocyanate which contains at least two aliphatically or cycloaliphatically bound isocyanate groups,

(ii) an organic compound which has at least two isocyanate-reactive groups,

(iii) an organic compound which comprises a member selected from the group consisting of diisocyanates which contain lateral, hydrophilic ethylene oxide units; compounds which are difunctional in the isocyanate-polyaddition reaction and contain lateral, hydrophilic ethylene oxide units; monoisocyanates which contain terminal, hydrophilic ethylene oxide units; compounds which are monofunctional in the isocyanate-polyaddition reaction and contain terminal, hydrophilic ethylene oxide units, and mixtures thereof; and optionally,

(iv) an organic compound which comprises a member selected from the group consisting of monoisocyanates or diisocyanates which contain ionic group(s) or potential ionic group(s); and compounds which are monofunctional or difunctional in the isocyanate-polyaddition reaction and contain ionic group(s) or potential ionic group(s),

wherein components (i), (ii), (iii) and (iv) are reacted in the presence of excess isocyanate groups and are chosen to provide a ratio of isocyanate groups to isocyanate-reactive groups of about 1.1 to 3.0 on an equivalent basis; component (iii) is present in an amount sufficient to provide about 0.35 to 10% by weight, based on the weight of the prepolymer, of lateral and/or terminal, hydrophilic ethylene oxide units; and component (iv) is treated with a neutralizing agent either before, during or after formation of the prepolymer in an amount sufficient to provide up to about 120 milliequivalents of ionic groups per 100 grams of said prepolymers, the amount of component (iii) and the neutralized portion of component (iv) being present in an amount sufficient to provide a stable, aqueous dispersion of the prepolymer;

(b) forming a dispersion of said prepolymer in water; and subsequently

(c) chain extending said prepolymer to form said cross-linked urea-urethane with a sufficient amount of a polyfunctional amine chain extender having an average functionality (number of amine nitrogens per molecule) between about 2.2 and 6.0 to provide a ratio of the terminal isocyanate groups of the prepolymer to the amino hydrogens of the polyfunctional amine of between about 1.0:0.6 and 1.0:1.1.

4,408,009

CO-CONDENSATES OF ALKYL SILICATES AND ALKOXY SILANES

Charles B. Mallon, Belle Mead, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 17, 1982, Ser. No. 349,596
Int. Cl.³ C08L *83/00, 83/02*
U.S. Cl. 524—858 **12 Claims**

1. Coating composition comprising a co-condensate of an organic orthosilicate and an alkyl or aryl trialkoxy or a dialkyl or arylalkyl dialkoxy silane in a ratio of about 3:1 to about 1:3 admixed with about 200 to about 1000 parts per 100 parts by volume of said co-condensate of a high temperature resistant pigment or filler.

4,408,010

POLYBLEND OF STYRENE COPOLYMERS AND MOLDED ARTICLE PRODUCED THEREFROM

Bi Le-Khac, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 4, 1982, Ser. No. 432,492
Int. Cl.³ C08L *35/06, 39/00, 25/08*
U.S. Cl. 525—73 **8 Claims**

1. A polyblend comprising a first and a second copolymer, the first copolymer consisting essentially of an α, β ethylenically unsaturated dicarboxylic acid or its anhydride copolymerized with at least one monovinyl-substituted aryl hydrocarbon monomer and, the second copolymer consisting essentially of maleimide copolymerized with at least one monovinyl substituted aryl hydrocarbon monomer and being present in the polyblend in an amount effective to increase the heat resistant properties of the first copolymer.

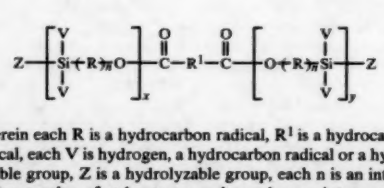
4,408,011

POLYSILOXANES AND THE USE THEREOF IN THE PRODUCTION OF SILANE MODIFIED ALKYLENE-ALKYL ACRYLATE COPOLYMERS

Austin E. Barnabeo, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 13, 1982, Ser. No. 416,601
Int. Cl.³ C08F *8/00*
U.S. Cl. 525—100 **27 Claims**

16. A process of preparing a water curable, silane modified alkylene-alkyl acrylate copolymer which comprises reacting a mixture containing an alkylene-alkyl acrylate copolymer, an organo titanate catalyst and a polysiloxane having the formula:



wherein each R is a hydrocarbon radical, R^1 is a hydrocarbon radical, each V is hydrogen, a hydrocarbon radical or a hydrolyzable group, Z is a hydrolyzable group, each n is an integer having a value of at least one, and x and y are integers each having a value of at least 1.

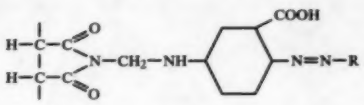
4,408,012

POLY-2(-2'-THIAZOLYL CONTAINING AZO)-5-MALEIMIDE BENZOIC ACID CHELATE POLYMER

Setsuko Furuya, Toride; Shunji Ohnishi, Yatabemachi, and Masao Kato, Sakuramura, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,103
Claims priority, application Japan, Mar. 31, 1981, 56/48831
Int. Cl.³ C08F 8/28, 8/30, 8/34
U.S. Cl. 525—161 2 Claims

1. A polymaleimide chelate polymer comprising a repeating unit component having the formula:



wherein R is selected from the group consisting of 2-thiazolyl and 2-benzothiazolyl groups.

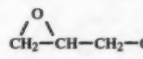
4,408,013

EPIHALOHYDRIN POLYMER CURE SYSTEMS

James P. Barnhouse, North Ridgeville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 24, 1982, Ser. No. 381,117
Int. Cl.³ C08L 71/02
U.S. Cl. 525—187 20 Claims

1. A composition comprising a polymer of an epihalohydrin and an unsaturated glycidyl ether of the general formula



wherein R is an ethylenically unsaturated radical, an organic peroxide and acrylic acid esters of polyols containing 2 to 12 carbon atoms.

4,408,014

METHOD FOR BLENDING PLASTIC AND RUBBER PHASE LATICES AND IMPROVING IMPACT PROPERTIES OF PLASTICS

Binnur Günesin, Warren, N.J., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 10, 1982, Ser. No. 376,530
Int. Cl.³ C08L 9/10, 33/24, 25/08
U.S. Cl. 525—218 24 Claims

1. A method for modifying the impact strength of plastics comprising the steps of:

blending a plastic phase latex comprising a copolymer of an N-(alkoxymethyl)acrylamide monomer and at least one vinyl monomer selected from the group consisting of monovinyl aromatic compounds and acrylic compounds with a rubber phase latex comprising a second copolymer of said N-(alkoxymethyl)acrylamide monomer and a conjugated diene monomer to form a mixture; and

coagulating said mixture.

4,408,015

PRODUCTION OF POLYVINYL CHLORIDE AND ACRYLATE COPOLYMER MODIFIER USEFUL FOR HIGH-SPEED CALENDAR MANUFACTURE OF SHEET STOCK

Karsten Flatau, Haltern, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,946
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105817
Int. Cl.³ C08L 33/12, 27/06
U.S. Cl. 525—227 6 Claims

1. A process for producing polyvinyl chloride which is processable by high speed calendering comprising suspension polymerizing vinyl chloride in the presence of a monomer-soluble catalyst and a protective colloid as suspension stabilizer; after the polymerization, adding 0.1–3% by weight, based on the amount of polyvinyl chloride of a latex of a copolymer of 75–95% by weight of methyl methacrylate, 0–20% by weight of styrene, and 5–25% by weight of an acrylic acid ester of a C_{4-8}-alkanol, the total weight percentage adding up to 100, while agitating the mixture; precipitating the latex onto the polyvinyl chloride while continuing the agitation; and, thereafter, separating the resultant modified suspension polyvinyl chloride by filtration and drying.

4,408,016

MONOMERIC COMPOSITION OF A DIOL BIS(ALLYL CARBONATE), A DISPERSED POLYMER, AND A MULTIFUNCTIONAL ACRYLATE MONOMER, AND POLYMERS PREPARED THEREFROM

Carl W. Eads, Wadsworth, and Ronald L. Haynes, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1982, Ser. No. 362,705
Int. Cl.³ C08L 47/00
U.S. Cl. 525—277 21 Claims

1. A composition of matter comprising:

(a) an aliphatic diol bis(allyl carbonate);

(b) an acrylate polymer; and

(c) a multifunctional acrylate monomer.

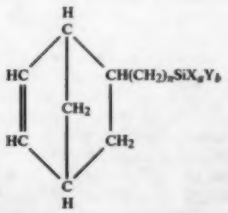
4,408,017

COUPLING PROCESS

Michael K. Martin, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 26, 1982, Ser. No. 382,019
Int. Cl.³ C08F 8/00, 8/18, 297/04
U.S. Cl. 525—288 9 Claims

1. A process for preparing a polymer comprising reacting a living lithium-terminated polymer having the formula P-Li wherein P is selected from the group consisting of polymer chains of one or more conjugated alkadienes having 4–12 carbon atoms and copolymer chains of one or more conjugated alkadienes having 4–12 carbon atoms and one or more monoalkenyl arenes of 8–18 carbon atoms, having the alkenyl radical attached to an arene ring carbon atom, with a coupling agent in a reaction zone, which agent has the general formula



where n is 0 or an integer from 1 to 10, and where each "X" is selected from the group consisting of hydrogen, a halogen or an alkyl radical having from 1 to 10 carbon atoms, each "Y" is selected from the group consisting of a halogen and —OR where "R" is an alkyl group having from 1 to 10 carbon atoms, "a" is zero or an integer selected from the group consisting of 1 and 2, and "b" is an integer equal to 3 minus "a", and where the halogen is selected from the group consisting of chlorine, fluorine, bromine and iodine.

2. The process according to claim 1 where n is zero.

3. The process according to claim 2 wherein said coupling agent is selected from the group consisting of bicycloheptenyl-2-trichlorosilane, bicycloheptenyltriethoxysilane, and (bicycloheptenyl)methyldichlorosilane.

9. The polymer produced by the process of claim 1 or claim 3.

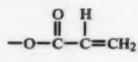
4,408,018

ACETOACETATE FUNCTIONALIZED POLYMERS AND MONOMERS USEFUL FOR CROSSLINKING FORMULATIONS

Benjamin Bartman, Maple Glen, and Graham Swift, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 29, 1982, Ser. No. 437,710
Int. Cl.³ C08L 33/14
U.S. Cl. 525—300 9 Claims

1. A method for effecting the crosslinking of polymers comprising the steps of introducing into an acrylate polymer backbone a plurality of pendant acetoacetate moieties, mixing said polymer with a crosslinking quantity of at least one polyacrylate having at least two groups of the structure



pendantly attached to an organic radical selected from the group consisting of alkyl, aryl, alkyl-aryl and polymeric radicals, and with a strong base catalyst effective to initiate a Michael Reaction and effecting reaction between said pendant acetoacetate moieties and said polyacrylate.

4,408,019

BLOCK COPOLYMERS OF ETHYLENE AND PROPYLENE

Harry W. Blunt, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 11, 1981, Ser. No. 272,452
Int. Cl.³ C08F 297/08
U.S. Cl. 525—323 4 Claims

1. As a new copolymer product, a thermoplastic elastomeric block copolymer having the general formula $(AB)_nA$ wherein each A is a crystalline polypropylene block having an intrinsic viscosity in the range of from about 0.25 to about 1.6 dl./gm., each B is a random ethylene-propylene copolymer block having an intrinsic viscosity in the range of from about 3.0 to about 7.0 dl./gm., said intrinsic viscosities being measured in decahydronaphthalene at 135° C., and n is an integer from 1 to about 12, said ethylene-propylene copolymer block being further characterized by containing from about 5 to about 15% by weight, based on the total monomer content in the block copolymer product, of crystalline polyethylene segments and by showing two principal absorbences in the infrared wave length region between about 12.8 and about 14.5 microns.

4,408,020

CURABLE POLYURETHANES

Edmond G. Kolycheck, Lorain, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 28, 1982, Ser. No. 392,851
Int. Cl.³ C08G 18/30
U.S. Cl. 525—415 14 Claims

1. Electron beam-curable polyurethanes comprising the reaction product of (1) hydroxyl terminated polyesters, polyethers, polylactones, polycarbonates, or polyhydrocarbon maacropolyols, (2) unsaturated polyethers having an average of ½ to 18 double bonds per molecule selected from the group consisting of polyethers having one terminal hydroxyl group and one terminal double bond group and polyether glycols having pendant double bond groups, and (3) an organic diisocyanate.

4,408,021

ADHESIVE COMPRISING REACTION PRODUCT OF GAMMA-ISOCYANATOPROPYLTRIETHOXY SILANE AND A THERMOPLASTIC POLYESTER

Howard I. Penn, Skokie, Ill., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Aug. 12, 1981, Ser. No. 292,225
Int. Cl.³ C08L 67/02, 67/00
U.S. Cl. 525—440 12 Claims

1. An adhesive comprising the reacted product of

(A) gamma-isocyanatopropyltriethoxy silane and

(B) a thermoplastic polyester formed by reacting

(i) a dibasic acid selected from the group consisting of terephthalic acid, isophthalic acid, and hexahydrophthalic acid and mixtures thereof, with (ii) a polymethylene glycol of the formula $HO(CH_2)_xOH$ where x is an integer from 2 to 10, neopentyl glycol or glycerin, and mixtures thereof, and (iii) an aliphatic dibasic acid selected from the group consisting of those having the formula $HOOC(CH_2)_nCOOH$ where n is an integer from 1 to 8, and mixtures of such acids whereby substantially no free isocyanate (NCO) remains in the adhesive.

4,408,022

BLEND OF POLYALKYLENE TEREPHTHALATE AND WHOLLY AROMATIC POLYESTER AND PROCESS FOR PRODUCING THE SAME

David E. Cincotta, South Orange, and Frank M. Berardinelli, Millington, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 15, 1981, Ser. No. 330,987
Int. Cl.³ C08L 67/00
U.S. Cl. 525—444 8 Claims

1. A process for producing a polymer blend which exibits an anisotropic melt phase and is capable of forming shaped articles having satisfactory mechanical properties, said process comprising the steps of:

(a) intimately mixing together approximately 50 to 75 percent by weight of a previously formed polyalkylene terephthalate and approximately 25 to 50 percent by weight of a previously formed melt processable wholly aromatic polyester which is capable of forming an anisotropic melt phase apart from the blend, and

(b) subsequently subjecting the blend thus formed to post-polymerization, said post-polymerization being conducted in the solid phase in a non-oxidizing atmosphere at a temperature within the range of approximately 250° C. to 300° C. and for a period of time within the range of approximately 8 to 72 hours so as to cause chemical interaction between said previously formed polymeric blend components.

4,408,023

POLYURETHANE DIACRYLATE COMPOSITIONS USEFUL FOR CONTACT LENSES AND THE LIKE

Francis E. Gould, Princeton, and Christian W. Johnston, Neshanic Station, both of N.J., assignors to Tyndale Plains-Hunter, Ltd., Princeton, N.J.

Division of Ser. No. 206,407, Nov. 12, 1980, Pat. No. 4,359,558.
This application Jun. 14, 1982, Ser. No. 387,913
Int. Cl.[3] C08G *18/32, 18/67;* C08F *283/04;* C08G *71/04*
U.S. Cl. 525—454 19 Claims

1. A contact lens comprising a hydrophilic polyurethane diacrylate composition which will form a hydrogel upon immersion in water and is permeable to gases, ions and other low molecular weight species, which composition is dimensionally stable and exhibits memory, said polyurethane diacrylate composition comprising from about 90 to about 65 weight percent of a hydrophilic polyurethane resin characterized by terminal hydroxyl groups and from about 10 to about 35 weight percent of a diacrylate.

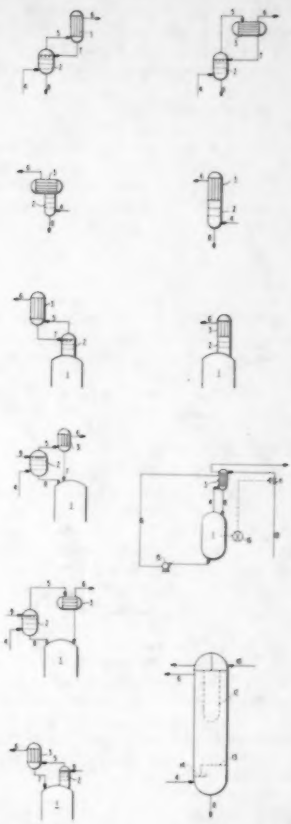
4,408,024

METHOD FOR THE HEAT REMOVAL FROM POLYMERIZATION REACTOR

Kiyoshi Matsuyama, and Hitoshi Hashimoto, both of Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Feb. 9, 1981, Ser. No. 232,486
Claims priority, application Japan, Feb. 7, 1980, 55-14536
Int. Cl.[3] C08F *6/06*
U.S. Cl. 526—67 1 Claim

1. In a method of the heat removal from a polymerization reactor with a reflux condenser, wherein an unsaturated hydrocarbon monomer having 2 to 8 carbon atoms is polymerized in an inert hydrocarbon or in the liquefied monomer having 3 to 8 carbon atoms as a solvent, in the presence of an olefin polymerization catalyst, by introducing a gas mixture withdrawn from the polymerization reactor into the reflux condenser where the gas mixture is condensed and separated into a condensed liquid and an uncondensed gas and returning the condensed liquid to the polymerization reactor and the uncondensed gas into the liquid phase in the polymerization reactor by the use of a compressor, the improvement comprising washing the gas mixture by bringing it into countercurrent contact with at least one of the condensed liquid obtained in the reflux condenser and the solvent to be supplied to the polymerization reactor, after it leaves the polymerization reactor and before it reaches the heat transfer surface of the reflux condenser.



4,408,025

PROCESS FOR POLYMERIZING OLEFINS

Randall S. Shipley, Alvin, Tex.; Kirby Lowery, Jr., Baton Rouge, La., and Ronald L. Gibbs, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 12, 1981, Ser. No. 320,231
Int. Cl.[3] C08F *4/02, 10/00*
U.S. Cl. 526—119 15 Claims

1. In a process for polymerizing one or more α-olefins in the presence of, as a catalyst for said polymerization, a catalytic reaction product of (A) a tetravalent titanium compound; (B) an organomagnesium component represented by the formula $MgR''_{2-x}MR''_y$ wherein each R'' is independently a hydrocarbyl group; M is aluminum, zinc or mixture thereof; x has a value from zero to about 10, and y has a value corresponding to the valence of M; and (C) a halide source selected from (1) a nonmetallic halide corresponding to the empirical formula R'X wherein R' is hydrogen or an active monovalent organic radical and X is halogen; (2) a metallic halide corresponding to the empirical formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of the Elements, R is a monovalent organic radical, X is halogen, y is

a number corresponding to the valence of M and a is a number from 1 to y; or (3) mixture thereof; however if either component (B) or (C) does not contain sufficient quantities of aluminum, then (D) an organoaluminum compound represented by the empirical formula $AlR_{3-a}X_a$ wherein R is hydrocarbyl or hydrocarbyloxy; X is a halogen and a is a number from zero to 3 is also present; said catalytic reaction product having atomic ratios of

Mg:Ti of from about 2:1 to about 100:1;

Al:Ti of from about 0.5:1 to about 200:1;

excess X:Al of from about 0.001:1 to about 2:1;

the improvement which comprises employing as the tetravalent titanium compound, a mixture of (a) a tetrahydrocarbyloxytitanium compound and (b) a dihydrocarbyloxytitanium oxide in a molar ratio of (a):(b) of from about 0.1:1 to about 10:1.

4,408,026

MIXTURES OF POLYMERS FOR MEDICAL USE

Christian Pusineri, Serezin du Rhone, and Jean Goletto, Ecully, both of France, assignors to Hospal-Sodip, S.A., Meyzieu, France

Filed Dec. 17, 1979, Ser. No. 103,894

Claims priority, application France, Dec. 15, 1978, 78 36065

Int. Cl.³ C08F *8/30*

U.S. Cl. 525—128 **11 Claims**

1. Organic polymer compositions, which can be used, in particular, for producing shaped articles, having good compatibility with biological materials characterised in that they consist of a mixture of vinyl chloride polymer and of polyether-urethane with tertiary amine and/or ammonium groups with the proportion of the polyether-urethane being from 1 to 99 percent by weight, relative to the total mixture.

4,408,027

FOILS OF POLYACETYLENE

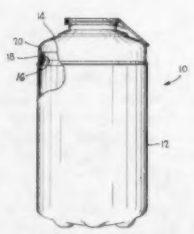
Jürgen Hocker, Bergisch-Gladbach, Fed. Rep. of Germany; Wolfgang Wieder, Lillebonne, France, and Rolf Dhein, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jul. 31, 1981, Ser. No. 288,887

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030194

Int. Cl.³ C08F *38/02*

U.S. Cl. 526—185 **2 Claims**



1. Process for the production of a suspension of polyacetylene in the form of particles having a diameter of from 0.01 to 1 mm and having a great number of fibrous appendices, wherein acetylene is introduced in an organic suspending agent under constant stirring, in the presence of an aluminum-containing organometallic mixed catalyst in an amount corresponding to 10–100 mmol aluminium per liter suspending agent, at temperatures of from −100° to +80° C., until a maximum of 10 g, preferably 1 to 3 g of polyacetylene per liter of suspending agent have formed.

4,408,028

OXIDATION-CURABLE EMULSION COMPOSITION CONTAINING A CELLULOSE DERIVATIVE

Yasuharu Nakayama; Hiroshi Iwai, and Hajime Sukejima, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Filed Nov. 26, 1980, Ser. No. 210,576

Claims priority, application Japan, Nov. 29, 1979, 54-153649

Int. Cl.³ C08F *2/32, 242/00, 299/00*; C08L *1/08*

U.S. Cl. 526—200 **15 Claims**

1. An oxidation-curable emulsion composition containing a cellulose derivative, said composition being prepared by polymerizing in emulsion a mixture consisting of at least one radical-polymerization unsaturated monomer and at least one cellulose derivative in the presence of an oxidation-curable fatty acid-modified, water-soluble acrylic resin.

2. The composition of claim 1 wherein said cellulose derivative is an ester-modified or ether-modified cellulose derivative having a number average molecular weight of about 3,000 to about 200,000.

4,408,029

POLYMER PREPARED FROM OCTADIENOL AND UNSATURATED DICARBOXYLIC ACID, PROCESS OF PREPARING THE SAME, AND COATING COMPOSITION PREPARED THEREFROM

Jerome L. Stavinoha, and Anthony W. McCollum, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 324,233, Nov. 23, 1981, Pat. No. 4,378,251. This application Oct. 21, 1982, Ser. No. 435,828

Int. Cl.³ C08F *22/10, 122/10, 222/10*

U.S. Cl. 526—321 **28 Claims**

1. A relatively low molecular weight polymer comprising units derived from an unsaturated dicarboxylic acid selected from fumaric acid, maleic acid, and mixtures thereof and units derived from octadienol, said polymer exhibiting a fluid viscosity of at least about 200 cp when measured in the neat state at room temperature using a Brookfield viscosimeter.

6. A process for producing a relatively low molecular weight polymer of a compound selected from dioctadienyl fumarate, dioctadienyl maleate, and mixtures thereof, said process comprising reacting octadienol with an unsaturated dicarboxylic acid or derivative thereof selected from fumaric acid, maleic acid, maleic anhydride, lower alkyl diesters of said acid, and mixtures thereof in the presence of an esterification catalyst.

4,408,030

WASTE CHLOROSILANE TREATMENT

Ollie W. Marko, Carrollton, Ky., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 22, 1982, Ser. No. 360,271

Int. Cl.³ C08G *77/00*

U.S. Cl. 528—10 **8 Claims**

1. A waste treatment process for treating a plurality of streams containing chlorosilicon compounds which waste treatment process comprises the steps of

(A) determining the average SiCl functionality of the streams,

(B) blending at least two streams so that the average SiCl functionality of the blended stream is greater than or equal to 2.8,

(C) hydrolyzing the blended stream by mixing the blended stream with an aqueous medium at a temperature between 50° C. and the boiling point of the aqueous medium, and

(D) removing the aqueous medium

to obtain a granular gel from said waste treatment process where said granular gel is easily handleable in further processing steps, shipment or disposal operations.

4,408,031

PROCESS FOR THE PREPARATION OF HEAT-CURABLE SILICONE RESINS USABLE ESPECIALLY AS ELECTRICAL INSULATING RESINS

Ulrich Holtschmidt; Götz Koerner, both of Essen; Manfred Priesch, Recklinghausen; Harald Rau, and Christian Weitemeyer, both of Essen, all of Fed. Rep. of Germany, assignors to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,185

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3103932

Int. Cl.³ C08G 77/04

U.S. Cl. 528—26 12 Claims

1. In a method for the preparation of heat-curable silicone resins, usable especially as insulating resins, by the reaction of low molecular weight multihydric alcohols with alkoxy siloxanes having the formula

$$R_a^2Si(OR^1)_b \quad O_{\frac{4-(a+b)}{2}}$$

in which

OR^1 represents an alkoxy group of primary or secondary aliphatic alcohols with 1 to 4 carbon atoms,

R^2 represents an alkyl or a phenyl group,

a has a value of 1.0 to 1.5,

b has a value of 0.1 to 1.0.

at temperatures of 80° to 200° C., optionally in the presence of known transesterification catalysts and solvents, with removal of the alcohol R^1OH, the alkoxy siloxanes being reacted with the alcohols in such relative amounts that one $SiOR^1$ group corresponds approximately to one COH group, and the reaction being terminated at a degree of conversion of 25 to 80% by cooling to a temperature of less than 80° C., the improvement which comprises the low molecular weight multihydric alcohols being a mixture of

(a) 25 to 95 mole percent of neopentylglycol hydroxypivalate, and

(b) 75 to 5 mole percent of a low molecular weight, at least trihydric alcohol.

4,408,032

MODIFIED POLYAMIDE-IMIDE RESINS AND METHOD FOR MAKING THE SAME

George H. Sollner, New Haven; Donny R. Disque, and Allan R. Knerr, both of Fort Wayne, all of Ind., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,777

Int. Cl.³ C08G 18/34

U.S. Cl. 528—48 28 Claims

1. An improved polyamide-imide composition of matter comprising the reaction product of aromatic tricarboxylic acid anhydride reactant, aromatic diisocyanate reactant and aliphatic dicarboxylic acid reactant reacted in a solution comprising aprotic solvent at a temperature ranging from about 70° C. to about 160° C. at atmospheric pressure, said tricarboxylic acid anhydride reactant being present in an amount which is greater than about twenty-five mol percent of the total tricarboxylic acid anhydride and aliphatic dicarboxylic acid reactant.

4,408,033

POLYURETHANES PREPARED FROM POLYISOCYANATE, POLYOL AND PHOSPHONOPOLYESTER OLIGOMERS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 330,106, Dec. 14, 1981. This application Sep. 27, 1982, Ser. No. 423,904

Int. Cl.³ C08G 18/06, 18/28

U.S. Cl. 528—72 4 Claims

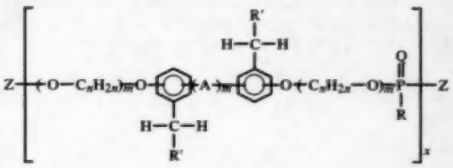
1. A polyurethane prepared by reacting in the presence of a suitable catalyst system a composition comprising

(A) an organic compound containing a plurality of —NCO or —NCS groups; with

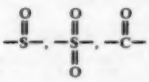
(B) a mixture of

(1) a polyol containing from about 2 to about 8 active hydrogen groups per molecule and an average active hydrogen equivalent weight of from about 30 to about 3000; and

(2) an oligomer or mixture of oligomers containing hydroxyl groups having recurring units represented by the following general formula



wherein each A is independently —O—, —S—, —S—S—,



or a divalent hydrocarbon group having from 1 to about 8 carbon atoms; each Q is independently oxygen or sulfur; each R is independently a hydrocarbon group having from about 1 to about 10 carbon atoms; each R′ is independently a —CH=CH_2 group or a —CX-H—CXH_2 group, wherein X is chlorine or bromine; each Z is independently a terminal moiety; each m is independently zero or one; each m′ independently has a value from 1 to about 5; each n independently has a value of 2, 3 or 4; and x has an average value of from 1 to about 10; and wherein components (1) and (2) are present in quantities such that from about 0 to about 95 percent of the active hydrogen atoms are contributed by component (1) and from about 5 to about 100 of the active hydrogen atoms are contributed by component (2) and wherein components (A) and (B) are present in quantities such that the ratio of —NCO and/or —NCS groups to active hydrogen groups is from about 0.85:1 to about 4:1.

4,408,034

METHOD FOR CURING URETHANE RESINS

Seiji Kazama, Kawanishi, and Michio Tanaka, Takatsuki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 9, 1982, Ser. No. 347,272

Claims priority, application Japan, Feb. 9, 1981, 56-18320; Dec. 16, 1981, 56-204037

Int. Cl.³ C08G 18/08, 18/18, 18/81

U.S. Cl. 528—54 7 Claims

1. A method for curing an isocyanate group-containing

compound, which comprises treating, with a tertiary amine in a vapor-phase state, an isocyanate compound having in one molecule not less than two isocyanate groups linked to an aromatic nucleus through a methylene group, or an isocyanate-terminated urethane resin obtained by the reaction thereof with an active-hydrogen containing compound.

4,408,035

PHTHALONITRILE RESIN FROM DIPHTHALONITRILE MONOMER AND AMINE

Teddy M. Keller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1981, Ser. No. 295,894

Int. Cl.³ C08G 83/00

U.S. Cl. 528—183 **29 Claims**

1. A phthalontrile resin obtained by admixing a primary amine in an amount from about 1 to about 40 percent of total resin weight with a diphthalonitrile monomer at a temperature from about the melting point of said phthalonitrile monomer to about the decomposition temperature of the resulting resin.

4,408,036

PREPARATION OF POLYTETRAMETHYLENE ADIPAMIDE

Reinoud J. Gaymans, Enschede, and Edmond H. J. P. Bour, Limbricht, both of Netherlands, assignors to Stamicarbon BV, Geleen, Netherlands

Filed Mar. 25, 1981, Ser. No. 247,548

Claims priority, application Netherlands, Mar. 26, 1980, 8001763

Int. Cl.³ C08G 69/28

U.S. Cl. 528—335 **8 Claims**

1. A process for the preparation of a white, high-molecular-weight nylon 4,6 polyamide, substantially consisting of repeating units of

$$-NH-(CH_2)_4-NH-CO-(CH_2)_4-CO-,$$

which process consists essentially in

(a) first forming in a separate first stage a polyamide prepolymer by heating a salt of 1,4-diaminobutane and adipic acid at a temperature between 150° C. and 310° C., wherein said heating within a temperature range of 150° C. to 210° C. is maintained for 15 to 120 minutes, and wherein said heating between 220° C. and 310° C. is minimized, while under a water-vapor-containing atmosphere, wherein the water-vapor partial pressure does not exceed 30 bar, discontinuing said first stage reaction when there has been obtained a polyamide prepolymer having

(1) a content of cyclic end groups not exceeding 0.20 mg equivalent per g of prepolymer, and

(2) having an η_{rel} of between 1.08 and 2.03 at 1 g of polymer in 100 g of 96% sulfuric acid at 20° C. and thereafter

(b) in a separate second stage, after-condensing said polyamide prepolymer, while

(1) under a water-vapor-containing atmosphere,

(2) and at a temperature of at least 200° C., to obtain a white, high-molecular-weight nylon 4,6 polymer having a η_{rel} of at least 2.20 at 1 g of polymer in 100 g 96% sulfuric acid at 20° C.

4,408,037

POLYAMIDE FROM CYCLOALIPHATIC SUBSTITUTED NONANE DIAMINE

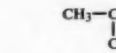
Charles A. Drake, and Stanley D. Turk, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 138,942, Apr. 9, 1980, Pat. No. 4,324,738, which is a division of Ser. No. 716,406, Aug. 23, 1976, Pat. No. 4,288,625, which is a continuation of Ser. No. 499,660, Aug. 22, 1974, abandoned. This application Nov. 30, 1981, Ser. No. 326,107

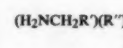
Int. Cl.³ C08G 69/26

U.S. Cl. 528—346 **21 Claims**

1. As a composition of matter, a polyamide resin prepared by reacting at least one cycloalkylalkylene diamine selected from the group consisting of:

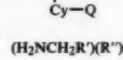


(XI)



(XII)

(XIII)



(XIV)

wherein each R′ is an alkylene or alkylidene radical of at least one carbon atom, R″ is an alkyl radical of at least one carbon atom, wherein Cy represents a cyclohexylene or perhydronaphthylene radical, and wherein Q is selected from the group consisting of —H, —X, —R‴, —N(R‴)$_2$, —NH$_2$.HX, —OR‴, —SH, —OH, and —SR‴; X is halogen and is fluorine, chlorine, bromine, or iodine; and R‴ is an alkyl radical of up to 6 carbon atoms;

with at least one alpha, omega-hydrocarbon dicarboxylic acid of C_6 to C_{16} carbon atoms per molecule under reaction conditions effective for forming said polyamide.

4,408,038

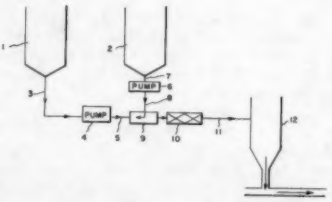
IN-LINE COAGULATION PROCESS FOR FLUOROELASTOMER EMULSIONS

Robert A. Covington, Jr., and Okan M. Ekiner, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Mar. 29, 1982, Ser. No. 363,377

Int. Cl.³ C08F 6/22

U.S. Cl. 528—485 **8 Claims**



1. A process for coagulating and agglomerating fluoroelastomer particles to prepare agglomerates of large particle size in a fluoroelastomer slurry process stream, which process stream containing the resultant large fluoroelastomer agglomerates is then passed to a dewatering device, the process comprising

(a) continuously injecting a coagulant solution under high pressure atomization into and countercurrent to the direc-

tion of flow of the fluoroelastomer slurry process stream, said coagulant solution being injected at a pressure of at least 1.38 MPa greater than the pressure of the fluoroelastomer slurry process stream, thereby creating a cogulant solution/fluoroelastomer slurry mixture, and

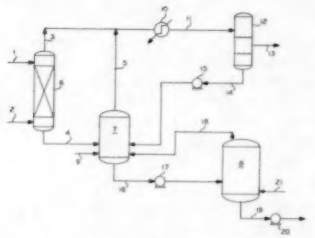
(b) maintaining the mixture under conditions of low shear and low turbulence for a predetermined amount of time subsequent to the injection of coagulant solution and prior to the mechanical dewatering, thereby forming agglomerated fluoroelastomer particles of large particle size.

4,408,039

SEPARATION OF POLYMER OF CONJUGATED DIENE FROM A SOLUTION POLYMERIZATION SOLVENT USING PRESTRIPPING STEP

Howard B. Irvin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1981, Ser. No. 297,451
Int. Cl.³ C08F *6/10*
U.S. Cl. 528—500 **10 Claims**



1. A process of separating a polymer of conjugated diene in solution polymerization solvent from said solvent, said process comprising:

(1) removing a portion of the solvent from the solution without precipitation of polymer by subjecting said polymer of conjugated diene in solution polymerization solvent to a prestripping operation using hot gas as a stripping agent; and

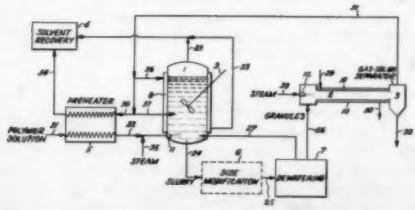
(2) subjecting the solution from step (1) to at least one further solvent removal treatment.

4,408,040

SLURRY GRANULATION-STEAM STRIPPING PROCESS FOR SOLVENT REMOVAL

John W. Flock, and Stephen L. Matson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 262,738, May 12, 1981, abandoned. This application Feb. 23, 1982, Ser. No. 351,380
Int. Cl.³ C08G *63/74, 63/72*
U.S. Cl. 528—500 **17 Claims**



1. A continuous process for recovering a thermoplastic polycarbonate or polyphenylene oxide resin from a solution of said resin in a solvent comprising introducing said solution into a first vessel through atomizing means along with steam, below the surface of the liquid contained in said first vessel; removing solvent vapor and water vapor overhead resulting in a bottom product water slurry of polymer-solvent granules maintained at about 1 to 50 weight percent solids with makeup hot water; removing said bottom product slurry from said first vessel; removing hot water from said slurry, resulting in polymer granules with absorbed solvent and water introducing said granules along with superheated steam into a second vessel wherein remaining solvent and water are volatilized from said granules while being carried through said second vessel by said superheated steam; separating polymer granules from the steam-solvent vapor mixture using separating means; recycling said steam-solvent vapor mixture for injection to the first vessel for steam jacket heating of the first vessel or for preheating the polymer solution before injection into the first vessel; and recovery granular polymer product from said separating means.

4,408,041

ANHYDROUS CRYSTALS OF MALTITOL AND THE WHOLE CRYSTALLINE HYDROGENATED STARCH HYDROLYSATE MIXTURE SOLID CONTAINING THE CRYSTALS, AND PROCESS FOR THE PRODUCTION AND USES THEREOF

Mamoru Hirao; Hiromi Hijiya, and Toshio Miyaka, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Nov. 13, 1981, Ser. No. 321,311
Claims priority, application Japan, Feb. 12, 1981, 56-19512
Int. Cl.³ C07G *15/04;* A23L *1/226;* A61K *31/605, 9/68*
U.S. Cl. 536—4.1 **4 Claims**

1. Anhydrous crystals of maltitol.

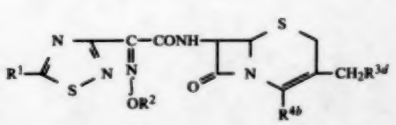
4,408,042

CEPHEM COMPOUNDS

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 214,785, Dec. 9, 1980, Pat. No. 4,332,800, which is a continuation-in-part of Ser. No. 180,295, Aug. 22, 1980, Pat. No. 4,338,313. This application Mar. 10, 1982, Ser. No. 356,724
Claims priority, application United Kingdom, Oct. 12, 1979, 793538; South Africa, Oct. 1, 1980, 80/6068
Int. Cl.³ C07D *501/20*
U.S. Cl. 544—22 **7 Claims**

1. A compound of the formula:



wherein R^1 is amino or protected amino, R^2 is lower alkyl of from 1 to 6 carbon atoms, R^{3d} is lower alkanoyl(lower)alkanoyloxy and R^{4b} is carboxy or protected carboxy, and pharmaceutically acceptable salts thereof.

4,408,043

FLUOROCARBON SURFACTANTS

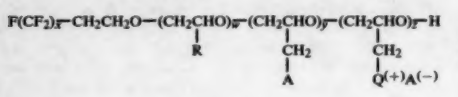
Virgil L. Seale, Houston, Tex.; James R. Stanford, Duncan, Okla.; James E. Briscoe, Duncan, Okla., and Glenn S. Penny, Duncan, Okla., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 8, 1982, Ser. No. 355,398

Int. Cl.³ C07C *95/02, 95/08;* C07D *295/08;* C07C *43/13*

U.S. Cl. 544—87 **10 Claims**

1. A chemical composition represented by the formula:



wherein:

(a) x is from 2–12;

(b) w is from 1–20;

(c) y is from 0–20, and z is from 0–20, provided that the sum, y+z is from 1–20;

(d) R is from the group of hydrogen, methyl, ethyl, propyl radicals and mixtures thereof;

(e) A is a halogen chosen from chlorine, bromine, or iodine; and

(f) Q is a cationic nitrogen radical from the group consisting of:

(1) an aromatic amino radical,

(2) an heterocyclic amino radical, and

(3) an amine radical represented by the formula:

wherein R_1, R_2 and R_3 are from the group consisting of hydrocarbon radicals containing from 1–30 carbon atoms and hydrogen radicals, provided that at least one of R_1, R_2 and R_3 is from the group consisting of alkyl, aryl, alkaryl and cyclo-aliphatic hydrocarbon radicals containing from 1–30 carbon atoms and that when any one of R_1, R_2 and R_3 radicals contains more than 4 carbon atoms, the other two radicals are each chosen from the group consisting of hydrogen, methyl, and ethyl radicals.

4,408,044

PREPARATION OF 3,6-DISUBSTITUTED 4-AMINO-1,2,4-TRIAZIN-5-ONES

Thomas Schmidt, Haan; Helmut Timmler, Wuppertal; Gerhard Bonse, Cologne; Heinz U. Blank, Odenthal, and Gerhard Marzolph, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

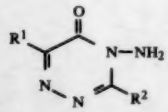
Filed Jan. 11, 1982, Ser. No. 338,811

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102318

Int. Cl.³ C07D *253/06*

U.S. Cl. 544—182 **12 Claims**

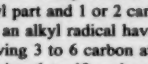
1. A process for the production of a 3,6-disubstituted 4-amino-1,2,4-triazin-5-one of the formula



in which

R^1 is hydrogen, an alkyl radical having 1 to 12 carbon atoms, cycloalkyl radical having 3 to 6 carbon atoms or a cycloalkenyl radical having 4 to 6 carbon atoms, an alkenyl radical having 2 to 6 carbon atoms, a furyl or thienyl radical or an aryl or aralkyl radical having 6 to 10 carbon atoms in the aryl part and 1 or 2 carbon atoms in the alkyl part, and

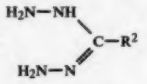
R^2 is an alkyl radical having 1 to 6 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, and an aryl or aralkyl radical having 6 to 10 carbon atoms in the aryl part and 1 or 2 carbon atoms in the alkyl part, comprising in two stages reacting an α-ketocarboxylic acid amide of the formula



in which

R^3 is hydrogen, or a group of the formula —CO—R^4, and

R^4 is an alkyl, cycloalkyl, optionally substituted aryl or optionally substituted aralkyl radical, with a hydrazidine of the formula



or an acid addition salt thereof, in the first process stage a condensation reaction taking place to give condensation products which still have open chains, and in the second process stage an elimination reaction with ring closure taking place to give the desired end product.

4,408,045

PROCESS FOR THE PREPARATION OF PARTIALLY ETHERIFIED METHYLOLMELAMINES

Wilhelm Dobramysl; Gerhard Stern, and Walter Raml, all of Linz, Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Mar. 23, 1982, Ser. No. 361,308

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112808

Int. Cl.³ C07D *251/70*

U.S. Cl. 544—196 **4 Claims**

1. A process for the preparation of a monomeric methylolmelamine which is partially etherified with methanol or ethanol and which contains at least 4 moles of formaldehyde per mole of melamine, which comprises carrying out, in a virtually anhydrous medium, a single stage addition reaction between formaldehyde, used as paraformaldehyde, and melamine and a simultaneous etherification reaction with methanol or ethanol, in a molar ratio of melamine:formaldehyde:alcohol of 1:5 to 10:6 to 20, under a nitrogen atmosphere at a temperature within the range of 50° to 90° C., a pH of 7 to 8 and a reaction time of from 3 to 30 hours, and subsequently evaporating the excess alcohol and formaldehyde.

4,408,046

PROCESS OF PREPARING MELAMINE

Rudolf Van Hardeveld, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 16, 1982, Ser. No. 368,971

Claims priority, application Netherlands, Apr. 7, 1982, 8201479

Int. Cl.³ C07D *251/60*

U.S. Cl. 544—201 **12 Claims**

1. In a process for the preparation of melamine from urea or thermal decomposition products thereof wherein a reaction mixture is cooled with an aqueous medium to form an aqueous product stream containing melamine and reaction by-products, whereafter product melamine is separated from said aqueous product stream leaving a residual aqueous stream which is recycled into said process, the improvement wherein a portion of said residual aqueous stream still containing reaction by-products is separated from the remainder of such stream and is

treated to remove by-products therefrom prior to being recycled to said process.

4,408,047

IMIDAZODIAZINES

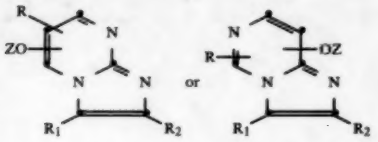
John J. Baldwin, Lansdale, and William C. Lumma, Jr., Pennsburg, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 135,022, Mar. 28, 1980, Pat. No. 4,330,543, which is a division of Ser. No. 969,631, Dec. 14, 1978, Pat. No. 4,233,301, which is a division of Ser. No. 796,958, May 16, 1977, Pat. No. 4,166,851. This application Nov. 19, 1981, Ser. No. 322,796

Int. Cl.³ C07D *487/04, 487/14*

U.S. Cl. 544—250 **7 Claims**

1. A compound having the formula



(III) (IV)

and pharmaceutically acceptable salts thereof wherein

Z is $—CH_2—CHOR_3—CH_2—NHR_4$ wherein R_3 is H or C_2–C_{12} acyl and R_4 is C_1–C_{12}alkyl,

R is H, $—SCF_3$, —CN, halogen C_{1-6}alkyl, NH_2, C_1–C_6 haloalkyl, C_1–C_{12}acyl, phenyl

$—COOR_5$ wherein R_5 is H C_1–C_6alkyl or C_6–C_{12} carbocyclic aryl,

$—CONR_6R_7$ wherein R_6 and R_7 when separate, are H or C_1–C_6alkyl and when joined, are $—CH_2—(CH_2)_3—CH_2$, $—CH_2—CH_2—O—CH_2—CH_2—$, $—CH_2—CH_2—NH—CH_2—CH_2—$, or $—CH_2—CH_2—N(CH_3)—CH_2—CH_2—$,

C_1–C_6alkylthio, C_1–C_6 alkylsulfinyl or C_1–C_6alkylsulfonyl, and

R_1 and R_2 when separate are R and when joined are $—(CH_2)_n$ wherein n is 3,4 or 5.

4,408,048

PROCESS FOR MAKING 5-FLUOROURACIL

Ralph J. DePasquale, Gainesville, and Paul D. Schuman, Hawthorne, both of Fla., assignors to PCR Incorporated, Gainesville, Fla.

Division of Ser. No. 110,192, Jan. 7, 1980, Pat. No. 4,299,961. This application May 18, 1981, Ser. No. 264,714

Int. Cl.³ C07D *239/20*

U.S. Cl. 544—313 **8 Claims**

1. Process for preparing 5-fluorouracil comprising hydrolyzing 2,4,5-trifluoropyrimidine at a temperature of about 2° to about 100° C. to produce 5-fluorouracil.

4,408,049

SUBSTITUTED PIPERAZINYL-1,2,4-TRIAZOLES

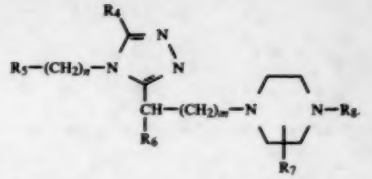
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 187,920, Sep. 17, 1980, Pat. No. 4,338,453. This application Mar. 26, 1982, Ser. No. 362,445

Int. Cl.³ C07D *401/00, 403/00*; A61K *31/41*

U.S. Cl. 544—360 **29 Claims**

1. A compound according to formula I



or a pharmacologically acceptable salt thereof,

wherein m is zero, one, 2 or 3;

wherein n is zero, one or 2,

wherein R_4 is:

(a) hydrogen;

(b) alkyl of one to three carbon atoms, inclusive;

(c) $R_{54}OCH_2—$, wherein R_{54} is defined below;

(d) $—CH(R_{35})(OH)$;

(e) $—R_{35}$;

(f) —SH;

(g) $S(O)_qR_{17}$, wherein q is zero, one, or two, and R_{17} is as defined below;

(h) 1-hydroxy-1-cyclohexyl; or

(i) 1-cyclohexen-1-yl;

wherein R_5, R_{15}, R_{25} and R_{35} are the same or different and are

(i) 2,3, or 4 pyridinyl, or

(ii) phenyl substituted by zero to 2 chloro, fluoro, bromo, alkyl of from one to 3 carbon atoms, or alkoxy of from one to 3 carbon atoms, or

(iii) phenyl substituted by one trifluoromethyl and zero to one of the previous phenyl substituents,

wherein R_6 is:

(a) hydrogen;

(b) $—OR_{54}$;

(c) alkanoyloxy of from one to 3 carbon atoms; or

(d) alkyl of from one to 3 carbon atoms; with the proviso that when m is zero, R_6 does not contain oxygen;

wherein R_7 is

(i) hydrogen,

(ii) methyl,

(iii) phenylmethyl, or

(iv) 2-phenylethyl,

wherein R_8 is:

(i) $—R_{15}$;

(ii) $—CH_2R_{15}$, or

(iii) $—CHR_{15}R_{25}$;

wherein R_{17} is methyl, phenyl, benzyl, or 2-phenylethyl; and wherein R_{54} is hydrogen or alkyl of one to 3 carbon atoms; or an enantiomer (when R_4 is $—CH(R_{35})OH$ or when R_6 is not hydrogen) or diastereomer (when R_4 is $—CH(R_{35})OH$ and R_6 is not hydrogen) of such compound.

4,408,050

SPIRO(INDOLINE-3,4'-PIPERIDINE) AND RELATED COMPOUNDS

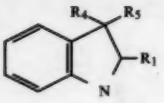
Helen H. Ong, Whippany, N.J., and James A. Profitt, Goshen, Ind., assignors to American Hoechst Corporation, Somerville, N.J.

Division of Ser. No. 121,824, Feb. 15, 1980, Pat. No. 4,307,235, which is a continuation-in-part of Ser. No. 936,185, Aug. 23, 1978, Pat. No. 4,209,625, which is a continuation-in-part of Ser. No. 789,723, Apr. 21, 1977, abandoned. This application Dec. 18, 1981, Ser. No. 332,178

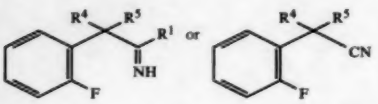
Int. Cl.³ C07D *471/10*

U.S. Cl. 546—17 **1 Claim**

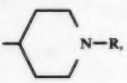
1. A method for preparing an indoline ring structure of the formula



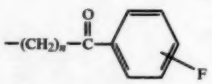
which comprises reductively cyclizing a compound of the formula



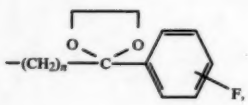
in which R^1 is hydrogen, loweralkyl or phenyl and R^4 and R^5 are the same or different and each can be loweralkyl or amino loweralkyl or, when taken together with the carbon atom to which they are attached, form a cyclic moiety of the formula



wherein R is hydrogen, loweralkyl, cyano, loweralkanoyl, phenoxycarbonyl, phenylloweralkyl, loweralkenyl, cycloalkylloweralkyl, in which the cycloalkyl moiety contains 3 to 8 carbon atoms benzoyl, carbamoyl,



or ethylene glycol ketal of the formula



and n is an integer of 1 to 4.

4,408,051

1-OXA-3,8-DIAZASPIRO[4.5]DECANES

Hans Hinsken, Kandern, Fed. Rep. of Germany; Wolfgang Mueller, Allschwil, Switzerland, and Hermann Schneider, Granzach-Wyhlen, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

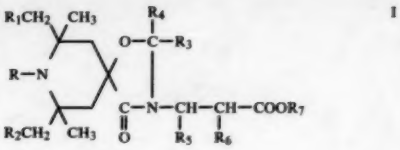
Filed Dec. 18, 1981, Ser. No. 331,986

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049041

Int. Cl.³ C07D *405/04*

U.S. Cl. 546—19 **14 Claims**

1. A compound of formula I



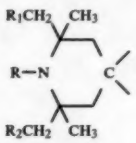
I

in which

R is hydrogen or C_{1-8}alkyl;

R_1 and R_2, independently, are hydrogen or C_{1-4}alkyl;

R_3 and R_4, independently, are hydrogen, C_{1-30}alkyl or benzyl; or R_3 is hydrogen or C_{1-4}alkyl and R_4 is phenyl, (C_{1-4}alkyl)phenyl, chlorophenyl, 4-hydroxy-3,5-t.-butylphenyl or naphthyl; or R_3 and R_4 together with the carbon atom to which they are attached form a C_{5-15}cycloalkylidene ring which may be unsubstituted or substituted by one C_{1-4}alkyl group, or form a group of formula (a)

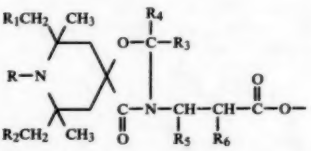


(a)

R_5 is hydrogen, methyl, phenyl or —COO(C_{1-21}-alkyl);

R_6 is hydrogen or methyl; and

R_7 is hydrogen; a C_{1-21}alkyl or C_{2-21}alkenyl group which may be unsubstituted or monosubstituted by phenyl or naphthyl and which may be interrupted by oxygen or by a C_{1-4}-alkylimine group; phenyl; (C_{1-12}alkyl)phenyl; C_{5-12}cycloalkyl or an saturated aliphatic hydrocarbon residue having 2–20 carbon atoms which may be interrupted by oxygen or by a C_{1-4}alkylimine group and which is substituted by 1–3 groups selected from (C_{1-21}alkyl)COO— and groups of formula (b).



(b)

4,408,052

PHOSPHOLIPID CARBAMATES

Motoo Hozumi, Omiya; Hiroaki Nomura, Takatsuki, and Yoshio Yoshioka, Nara, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

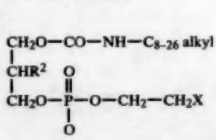
Filed Feb. 25, 1981, Ser. No. 237,970

Claims priority, application Japan, Feb. 27, 1980, 55-24333; Oct. 14, 1980, 55-143980

Int. Cl.³ C07F *9/58, 9/65*

U.S. Cl. 546—22 **5 Claims**

1. A compound of the formula:



wherein R^2 is H or methoxy and X is pyridinio or thiazolio or a pharmaceutically acceptable salt thereof.

4,408,053

(4-PIPERIDYL)-SUBSTITUTED PHENYL KETONES

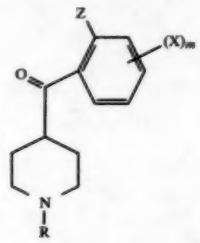
Joseph T. Strupczewski, Flemington, N.J.; Beth A. Gardner, San Jose, Calif., and Richard C. Allen, Flemington, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 319,871, Nov. 12, 1981, Pat. No. 4,355,037. This application Aug. 6, 1982, Ser. No. 405,965

Int. Cl.³ C07D *211/30*

U.S. Cl. 546—226 **16 Claims**

1. A compound of the formula



wherein R is hydrogen, loweralkyl, benzyl or a group of the formula

wherein R^1 is hydrogen, loweralkyl or a group of the formula OR^2 wherein R^2 is benzyl; X is hydrogen, loweralkyl, loweralkoxy, halogen or hydroxy; Z is halogen or hydroxy; m is 1 or 2; the optical antipodes thereof; or salts thereof when R is hydrogen, loweralkyl or benzyl.

3. The compound of claim **1** which is 4-(2,4-difluorobenzoyl)-N-formylpiperidine.

4,408,054

OXIMES OF 4-BENZOYL-PIPERIDINES

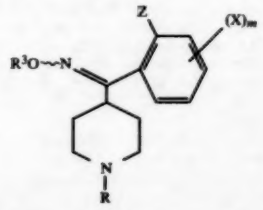
Joseph T. Strupczewski, Flemington, N.J.; Beth A. Gardner, San Jose, Calif., and Richard C. Allen, Flemington, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 319,871, Nov. 12, 1981, Pat. No. 4,355,037. This application Aug. 11, 1982, Ser. No. 407,235

Int. Cl.³ C07D *211/28*

U.S. Cl. 546—226 **22 Claims**

1. A compound of the formula



wherein R is hydrogen, loweralkyl, loweralkenyl or a group of the formula

wherein R^1 is hydrogen, loweralkyl or a group of the formula OR^2 wherein R^2 is benzyl; R^3 is hydrogen or a group of the formula

wherein R^4 is hydrogen, loweralkyl; X is hydrogen, loweralkoxy, loweralkyl, halogen or hydroxy; Z is halogen or hydroxy; m is 1 or 2; the geometric isomers and optical antipodes thereof; or salts thereof where R is hydrogen, loweralkyl or loweralkenyl.

5. The compound of claim **1** which is 1-acetyl-4-(2-hydroxy-5-methoxybenzoyl)piperidine oxime.

4,408,055

AZOLYLOXY-CARBOXYLIC ACID N-OXY-AMIDE COMPOUNDS

Heinz Forster; Fritz Maurer; Volker Mues, all of Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

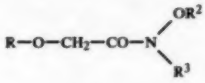
Filed Nov. 5, 1980, Ser. No. 204,147

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946524

Int. Cl.³ C07D *283/02, 285/02, 269/02, 271/00*

U.S. Cl. 548—125 **23 Claims**

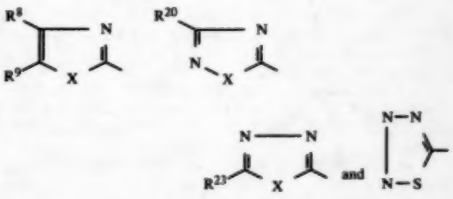
1. Azolyloxy-carboxylic acid N-oxy-amide compound of the formula



wherein

R^2 represents a C_1–C_6-alkyl, C_1–C_4alkoxy-ethyl, allyl or propargyl radical and R^3 represents a C_1–C_6-alkyl, allyl, propargyl or cyclohexyl, and in which

R represents an azolyl radical selected from



wherein

X represents oxygen or sulphur, the radicals R^8, R^9, R^{20} and R^{23} which can be identical or different, independently represent a hydrogen, bromine or chlorine atom or a nitro, cyano, C_1–C_3-alkyl-carbonyl or C_1–C_3-alkoxycarbonyl radical, a phenyl radical monosubstituted or disubstituted by fluorine, chlorine or bromine, methyl, methoxy, nitro, amino and/or cyano, or a phenoxy, phenylthio, C_1–C_3-alkylthio, C_1–C_3-alkoxy, C_1–C_3 alkylsulphinyl, C_1–C_3-alkylsulphonyl, C_1–C_4-alkyltrifluoromethyl, cyano-C_1–C_4-alkyl or C_2–C_4-alkenyl.

4,408,056

ANTHRAQUINONE VAT DYESTUFFS

Walter Hohmann, Leverkusen, and Josef Stawitz, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

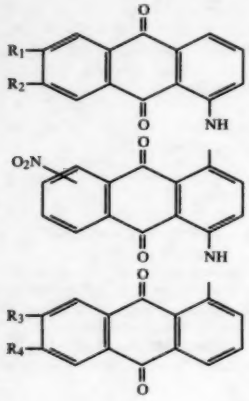
Filed Dec. 29, 1982, Ser. No. 454,300

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1982, 3200707

Int. Cl.³ C09B 5/26

U.S. Cl. 548—416 2 Claims

1. Nitrotrianthrimidecarbazoles of the formula



(I)

in which

the NO_2 group is in the α- or β-position and

R_1, R_2, R_3 and R_4 designate hydrogen or halogen, such as chlorine and bromine.

4,408,057

4-HETEROCYCLIC-SUBSTITUTED-2-INDANYL ALCOHOLS AND INSECTICIDAL ESTER DERIVATIVES

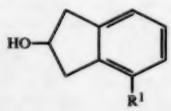
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 303,292, Sep. 17, 1981, Pat. No. 4,368,205, and a continuation-in-part of Ser. No. 202,813, Oct. 31, 1980, Pat. No. 4,346,251, which is a continuation-in-part of Ser. No. 42,372, May 24, 1979, Pat. No. 4,263,319. This application Dec. 20, 1982, Ser. No. 451,293

Int. Cl.³ C07D 231/06, 207/12, 333/24; A01N 43/46

U.S. Cl. 548—562 3 Claims

1. A compound of the formula



in which R^1 is a heterocyclic radical selected from furanyl, thienyl, pyridyl, pyrimidyl, oxazolyl, pyrrolyl, isoxazolyl, thiazolyl, and isothiazolyl.

4,408,058

PREPARATION OF ORTHO-SULFOBENZOIC ACID ANHYDRIDE BY CATALYZED THERMOLYSIS

Mark L. Mitchell, III, and Richard P. Carr, both of Cincinnati, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed May 26, 1982, Ser. No. 382,316

Int. Cl.³ C07D 327/04

U.S. Cl. 549—33 25 Claims

1. A process for the synthetic of ortho-sulfobenzoic acid anhydride which comprises heating a 2-sulfohalide benzoate in the presence of a catalytic amount of a Friedel-Crafts catalyst.

4,408,059

SPIROKETALS USEFUL AS INTERMEDIATES IN THE SYNTHESIS OF MILBEMYCIN AND AVERMECTIN MACROLIDES

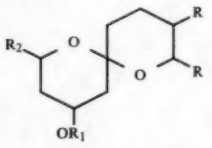
Amos B. Smith, III, Merion, Pa., and Steven R. Schow, Wilmington, Del., assignors to University Patents, Inc., Norwalk, Conn.

Filed Dec. 4, 1981, Ser. No. 327,641

Int. Cl.³ C07D 309/06, 493/22; C07H 17/08; C07C 65/00

U.S. Cl. 549—214 6 Claims

1. A spiroketal having the general formula:



wherein

R is alkyl;

R_1 is hydrogen, alkyl, aryl, aralkyl, COR. or SiR_3;

R_2 is $(CH_2)_xCHO$, $(CH_2)_xCH(OZ')CR{=}CH_2$, or $(CH_2)_xCH{=}CRCH_2CHRZ$;

x is 1 to 20

Z is CHO, CH_2OH, COOH, or $COSiR_3$; and

Z' is hydrogen or $COCH_2R$.

4,408,060

CHEMICAL COMPOUNDS AND PROCESSES

Ramesh M. Kanojia, Somerville; Michael P. Wachter, Bloomsbury, and Robert H. K. Chen, Belle Mead, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 29,231, Apr. 11, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 224,416

Int. Cl.³ C07D 493/10, 407/06

U.S. Cl. 549—332 13 Claims

1. 2S,3R-6-[2'-hydroxy-(6,1'-oxido)-ethy]-2-methyl-2-(4,8-dimethyl-5-oxo-7-nonenyl)-oxepan-3-ol.

3. 2S,3R-6-(2-hydroxyethylidene)-2-methyl-2-(6,7-oxido-5-oxo-4,7,8-trimethylnonyl)-oxepan-3-ol.

13. 2S,3R-6-[6,1'-oxido-2'-(tetrahydropyran-2-yloxy)-ethyl]-2-methyl-2-(4,8-dimethyl-7,8-oxido-5-oxo-7-nonyl)-3-(tetrahydropyran-2-yloxy)-oxepane.

4,408,061

PROCESS FOR THE PREPARATION OF 1,4-3,6-DIANHYDRO-HEXITOLS

Herbert Salzburg, Cologne; Holger Meyborg, Odenthal, and Heinz Ziemann, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,353

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3111092

Int. Cl.³ C07D *493/04*

U.S. Cl. 549—464 11 Claims

1. In a process for the preparation of 1,4-3,6-dianhydro-hexitols from hexitol comprising splitting off of water by means of strong acids, the improvement wherein gaseous hydrogen halide is used as the acid and the reaction is carried out in the absence of both water and organic solvents.

4,408,062

PROCESS FOR PREPARING LOW MOLECULAR WEIGHT EPOXY RESINS

James L. Bertram; George E. Ham, and Wuu-Nan Chen, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1982, Ser. No. 359,463

Int. Cl.³ C07D *301/28*

U.S. Cl. 549—517 4 Claims

1. In a process for preparing low molecular weight epoxy resins by (1) reacting at least one epihalohydrin with at least one polyhydric phenol in the presence of at least one alkali metal hydroxide thereby forming a halohydrin-containing intermediate product and (2) subsequently dehydrohalogenating said intermediate product; the improvement which comprises

(a) employing said alkali metal hydroxide in a quantity which is stoichiometric with the quantity of polyhydric phenol employed;

(b) adding the total amount of alkali metal hydroxide at the beginning; and

(c) conducting the epihalohydrin-polyhydric phenol reaction in the presence of an additional halohydrin other than that which is formed in the reaction and which has a reaction rate constant with respect to said alkali metal hydroxide at least as high as that of the halohydrin intermediate product and which additional halohydrin has been added in a quantity which is sufficient to increase the yield based on said epihalohydrin.

4,408,063

PREPARATION OF EPIHALOHYDRIN ENANTIOMERS

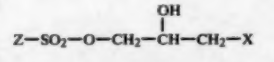
John J. Baldwin, Gwynedd Valley, and David E. McClure, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 176,236, Aug. 8, 1980, abandoned, which is a continuation of Ser. No. 940,681, Sep. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 919,590, Jun. 27, 1978, abandoned. This application Apr. 19, 1982, Ser. No. 369,724

Int. Cl.³ C07D *301/02*

U.S. Cl. 549—518 6 Claims

1. A process for preparing an enantiomer of epihalohydrin which comprises treating an enantiomer of an alcohol of the formula:



wherein Z is phenyl, monosubstituted phenyl, CF_3 or C_1–C_6 alkyl and X is Cl or Br, with alkali metal glycolate and removing said epihalohydrin by distillation.

4,408,064

BIS-(SILYLETHYL)-OLIGOSULPHIDES AND PROCESS FOR THEIR PRODUCTION

Rudolf Schwarz, Alzenau-Wasserlos; Peter Kleinschmit, Hanau; Christa Liedtke, Bruchköbel, and Siegfried Wolff, Bornheim-Merten, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 106,862

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856229

Int. Cl.³ C07F *7/08, 7/18*

U.S. Cl. 556—427 7 Claims

1. A process for producing a bis-(silyethyl)-oligosulphide corresponding to the following average formula

$$\{R_4-(m+n)\ R_n^1Si[CH_2CH_2]\}_2S_{mx} \qquad I$$

comprising reacting a vinyl silane corresponding to the formula

$$(CH_2{=}CH)_m\text{-}SiR_n^1R_{4-(m+n)} \qquad II$$

with sulphur and, optionally, hydrogen sulphide in molar ratios of vinyl silane to sulphur of from 1:2.5 to 1.10 and vinyl silane to hydrogen sulphide of from 1:0 to 1:5 at a temperature in the range of from about 100° to 210° C., under a pressure of from 1 to 25 bars (total pressure at the reaction temperature) and in the presence of a sulphidation catalyst, after which, optionally, one or more of the groups R of the reaction product are hydrolysed.

4,408,065

PROCESS FOR THE SEPARATION OF METHYLPARABEN FROM WINTERGREEN OIL

Armand J. deRosset, Sarasota, Fla.; James W. Priegnitz, Elgin, and Arthur M. Landis, Carpentersville, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 23, 1981, Ser. No. 246,547

Int. Cl.³ C07C *69/88*

U.S. Cl. 560—67 14 Claims

1. A process for separating methylparaben from a feed mixture comprising methylparaben and wintergreen oil which process employs an adsorbent comprising a type X or type Y zeolite, which process comprises the steps of:

(a) maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;

(b) maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;

(c) maintaining a purification zone immediately upstream from said adsorption zone, saod purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;

(d) maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;

(e) passing said feed mixture into said adsorption zone at adsorption conditions to effect the selective adsorption of said methylparaben to the substantial exclusion of the wintergreen oil by said adsorbent in said adsorption zone

and withdrawing a raffinate output stream comprising said wintergreen oil from said adsorption zone;

(f) passing a desorbent material having an average boiling point substantially different from that of the feed mixture into said desorption zone at desorption conditions to effect the displacement of said methylparaben from the adsorbent in said desorption zone;

(g) withdrawing an extract output stream comprising said methylparaben from said desorption zone; and

(h) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone said feed input stream, a raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of said extract output and raffinate output streams.

4,408,066

METHYL CYCLOPROPANE-1,3-DICARBOXYLATE

Alain Krief, Wepion, Belgium, assignor to Roussel Uclaf, Paris, France

Filed Oct. 2, 1981, Ser. No. 308,026

Claims priority, application France, Oct. 10, 1980, 80 21690

Int. Cl.³ C07C *69/757*

U.S. Cl. 560—124 **1 Claim**

1. A compound selected from the group consisting of the salts of d and l α-methyl-benzylamine and the monomethyl esters of (1R,3S)cis and (1S,3R)cis 2,2-dimethyl-cyclopropane-1,3-dicarboxylic acid.

4,408,067

PROCESS FOR PRODUCING CARBOXYLIC ACID ESTERS FROM NITRILES

Tomio Nakamura, Ichikawa, and Shunichi Doi, Yokohama, both of Japan, assignors to Nitto Chemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 116,198, Jan. 28, 1980, abandoned. This application Jul. 28, 1981, Ser. No. 287,655

Claims priority, application Japan, Jan. 26, 1979, 54-7218; Jan. 26, 1979, 54-7219

Int. Cl.³ C07C *67/22*

U.S. Cl. 560—215 **10 Claims**

1. In a process for preparing a carboxylic acid ester from a nitrile, water and alcohol in the vapor phase, wherein the vapor is brought into contact with a catalyst, the improvement which comprises said catalyst being a titanium containing oxide catalyst which is obtained by hydrolyzing or neutralizing a water soluble titanium salt and subsequently calcining the resulting precipitate at a temperature in a range of about 300° to 750° C. and having the empirical formula $Ti_aMe_bX_cO_d$, wherein Me represents at least one element selected from the group consisting of Cu, Ag, Au, Mg, Zn, Sn, Pb, Zr, V, Bi, Cr, W, Mo, Mn, Fe, Co, and Ni and X represents at least one element selected from the group consisting of Si and Sb and the subscripts a, b, c and d designate the atomic ratio and when a is 1, b is 0.01 to 12, c is 0 to 12 and b+c is 0.01 to 12 and d is the oxygen content of the catalyst formed by the combination of the above components.

4,408,068

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 2-CHLOROPROPIONIC ACID ESTERS

Manfred Koch, Eppstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

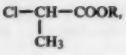
Filed Jan. 25, 1982, Ser. No. 342,584

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102516

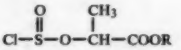
Int. Cl.³ C07C *69/63*

U.S. Cl. 560—226 **8 Claims**

1. A method for making an optically active 2-chloropropionic acid ester of the formula



wherein R is (C_1–C_6) alkyl, which method comprises decomposing an optically active 2-chlorosulfinoxypropionic acid ester of the formula



in the presence of a quaternary ammonium salt or of a phosphonium salt as a catalyst.

4,408,069

CONVERSION OF METHANOL TO METHYL ACETATE USING IRON-COBALT CATALYST

Gerald Doyle, Bedminster, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 78,564, Sep. 24, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,147

Int. Cl.³ C07C *67/36, 69/14*

U.S. Cl. 560—232 **10 Claims**

1. A process for the homogeneous catalytic conversion of methanol to methyl acetate which comprises contacting methanol with carbon monoxide in an organic solvent in the presence of a catalytically effective amount of an iron-cobalt carbonyl cluster complex of the formula $M[FeCo_3(CO)_{12}]$ or $M[CoFe_3(CO)_{13}]$ where M is hydrogen, alkali metal cation, $(C_6H_5)_3PNP(C_6H_5)_3^+$, cations of C_3 to C_9 heterocyclic compounds having nitrogen in a ring, $R_1R_2R_3R_4N^+$, $R_1R_2R_3R_4P^+$ or $R_1R_2R_3R_4As^+$ where R_1 to R_4 are each hydrogen, C_1 to C_{20} alkyl, C_3 to C_8 cycloalkyl, benzyl, phenyl or phenyl substituted by lower alkyl, lower alkoxy or halogen and an effective amount of an iodide promoter, and heating the resulting mixture to a temperature of from about 100° C. to 250° C. at a pressure of from about 5 to 100 MPa.

4,408,070

PURE CRYSTALLINE RACEMIC SODIUM PARAHYDROXYMANDELATE, PROCESS FOR ITS PREPARATION AND USES THEREOF

Alain Schouteeten, 17, rue de Normandie, Ezanville, Val d'Oise, and Yani Christidis, 12, rue de Constantinople, Paris 8eme, Seine, both of France

Continuation of Ser. No. 96,597, Nov. 21, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 284,835

Claims priority, application France, Jun. 15, 1979, 79 15392

Int. Cl.³ C07C *65/135*

U.S. Cl. 562—470 **3 Claims**

1. A process for the preparation of crystalline sodium paraformylphenolate comprising

subjecting crystalline racemic sodium parahydroxymandelate in aqueous solution to catalytic decarboxylating oxidizing degradation hot, under oxygen pressure, and in the presence of sodium hydroxide,

said crystalline racemic sodium parahydroxymandelate being prepared, as a preliminary operation, in pure crystalline form according to the steps consisting essentially of

condensing, over a period of approximately one-half hour, glyoxylic acid or sodium glyoxylate with an excess of 2 to 3 mols of phenol, in water, and in the presence of 2 to 3 mols of sodium hydroxide per mol of glyoxylic acid, at a temperatue between 70° and 100° C.;

neutralizing the resultant reaction medium, and removing unconverted phenol either by steam distillation or by extraction with a water-immiscible organic solvent;

concentrating the resultant reaction medium until the start of the formation of crystals, and cooling the resultant crystals; and

drying said crystals to constant weight at approximately 40° C. to provide pure sodium parahydroxymandelate crystallized with one molecule of water and substantially free of any ions of chloride, acetate, formate or sulphate, or drying said crystals at approximately 110° C. to provide pure anhydrous crystalline sodium parahydroxymandelate substantially free of any ions of chloride, acetate, formate or sulphate.

4,408,071
PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACIDS

S. Erik Pedersen, Mentor; Harley F. Hardman, Lyndhurst, and Louis F. Wagner, Solon, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed May 11, 1981, Ser. No. 262,077
Int. Cl.³ C07C *51/235, 51/255, 53/08, 63/06*
U.S. Cl. 562—536 **12 Claims**

1. A process for preparing a carboxylic acid from an aldehyde, the process comprising contacting a gaseous aldehyde selected from the group consisting of acetaldehyde and benzaldehyde with oxygen in the presence of a catalyst of the formula

$$Mo_{12}P_{0.1\text{-}3}Cu_{0.01\text{-}2}V_{0.1\text{-}3}M_{0.1\text{-}3}M'_{0.01\text{-}3}O_x \qquad (I)$$

where

M is at least one of K, Rb, Cs and Tl;

M′ is at least one of Be, Mg, Ca, Sr, Ba, Nb, Ti, Zr, Mn, Fe, Co, Ni, Zn, Ag, Al, Ge, Sn, Pb, As, Bi, Te, Ce, Th, U and Sb; and

x is a number that satisfies the valence requirements of the other elements present.

4,408,072
AMIDO METHOXYETHYLAMINES

Sivaraman Raghu, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 152,268, May 21, 1980, Pat. No. 4,314,079, which is a division of Ser. No. 63,289, Aug. 2, 1979, Pat. No. 4,245,103, which is a continuation of Ser. No. 958,222, Nov. 6, 1978, abandoned. This application May 8, 1981, Ser. No. 261,866
Int. Cl.³ C07C *103/82*
U.S. Cl. 564—185 **1 Claim**

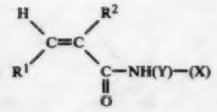
1. The compound N-(2-phenyl-2-benzoylamino)ethyl-2-methoxyethylamine.

4,408,073
PROCESS FOR PREPARATION OF α, β-UNSATURATED N-SUBSTITUTED-CARBOXYLIC ACID AMIDES

Bernhard Goossens, Velbert; Erich Küster, Krefeld; Kurt Dahmen, Monchen-Gladbach, and Eduard Barthell, Krefeld, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen & Cie, Krefeld, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,245
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856383; Mar. 24, 1979, 2911642
The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.
Int. Cl.³ C07C *102/00*
U.S. Cl. 564—204 **8 Claims**

1. A process for the preparation of α,β-unsaturated N-substituted carboxylic acid amides of the general formula



where

R^1 and R^2 are hydrogen or methyl,

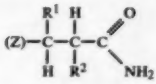
Y is a divalent/straight-chain or branched organic moiety having 2 to 30 carbon atoms, and

X is hydrogen or the radical of an amine of the formula $-N(R^4)(R^5)$, where R^4 and R^5 represent alkyl radicals having 1 to 4 carbon atoms,

by transamidation of β-substituted carboxylic acid amides with primary amines of the general formula

$$H_2N—(Y)—(X)$$

where Y and X have the meaning given above, with elimination of ammonia and conversion of the N-substituted carboxylic acid amides to the α,β-unsaturated N-substituted acid amides, characterized in that there are used as starting products β-substituted carboxylic acid amides of the general formula



where

R^1 and R^2 are hydrogen or methyl, and

Z is a hydroxyl group or the moiety of an alcohol of the formula $R^8O—$, where

R^8 represents an alkyl radical having 1 to 4 carbon atoms and the conversion of the N-substituted α,β-unsaturated carboxylic acid amides is effected by heating in the vapor phase in the presence of catalysts.

4,408,074
PROCESS FOR PREPARING 1-(3,5-DIMETHOXY-4-HYDROXY PHENYL)-2-(N-METHYLAMINO) ETHANOL HYDROCHLORIDE

Massimo Signorini; Attilio Trebbi, both of Baranzate, and Luigi Molteni, Malnate, all of Italy, assignors to Dr. Lo. Zambeletti S.p.A., Milan, Italy

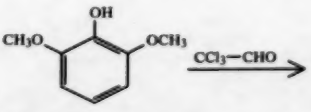
Filed Nov. 2, 1981, Ser. No. 317,517
Claims priority, application Italy, Nov. 28, 1980, 26293 A/80
Int. Cl.³ C07C *91/16*
U.S. Cl. 564—361 **5 Claims**

1. A process for manufacturing 1-(3,5-dimethoxy-4-hydroxy phenyl)-2-(N-methylamino) ethanol hydrochloride which comprises:

(a) condensing 2,6-dimethoxy phenol with anhydrous chloral, thus obtaining 1-(3,5-dimethoxy-4-hydroxy phenyl)-2,2,2-trichloro ethanol;

(b) heating an aqueous solution of said 1-(3,5-dimethoxy-4-hydroxyphenyl)-2,2,2-trichloro ethanol with an alkali metal or an alkaline-earth metal metabisulfite thus obtaining an alkali metal or an alkaline-earth metal 1-hydroxy-2-keto-2-(3,5-dimethoxy-4-hydroxyphenyl) ethanesulfonate in which M is an alkali or alkaline earth metal; and

(c) subjecting to amination under reducing conditions with methylamine in the presence of hydrogenation catalysts said compound followed by reaction with hydrochloric acid:



(XI)

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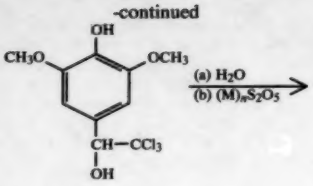
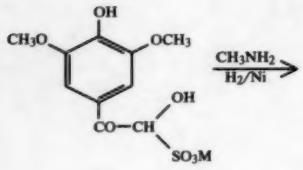
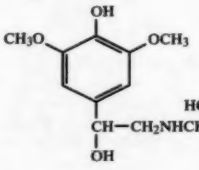


(XII)



(XIII)



(I)

wherein n=1 or 2.

4,408,075

PROCESS FOR THE PREPARATION OF TRIS-(ETHER-AMINES) AND THE TRIS-(ETHER-AMINES) PRODUCED

Gerard Soula, Meyzieu, and Louis Linguenheld, Saint-Genis-Laval, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 21, 1980, Ser. No. 142,258

Claims priority, application France, May 3, 1979, 79 11100

Int. Cl.³ C07C *91/02*

U.S. Cl. 564—474 **19 Claims**

1. An improved process of preparing tris-(ether-amines) of formula (I):

(I) $N\text{-}[A\text{-}O\text{-}(B\text{-}O)_n R]_3$ (I)

in which R represents a member selected from the class consisting of an alkyl radical containing from about 1 to 24 carbon atoms, a clcylohexyl radical, a phenyl radical, and an alkylphenyl radical whose alkyl group contains from about 1 to 12 carbon atoms;

A and B are similar or different and represent a linear alkanediyl group containing 2 or 3 carbon atoms, and

n represents a whole number between zero and 4, by ammonolysis in liquid phase of an alkylene glycol mono-ether of formula (II):

$HO\text{-}A\text{-}O\text{-}(B\text{-}O\text{-})_n R$ (II)

in which R, A, B, and n ave the meaning given above, by means of at least one ammonolysis agent selected from among ammonia and the ether-amines of formula (III):

$(3-p)HN)\text{-}[A'\text{-}O\text{-}(B'\text{-}O\text{-})_{n'}R']_p$ (III)

in which R', A', B', and n' are identical to R, A, B, and n, respectively, and p is equal to 1 or 2, in the presence of a hydrogenation-dehydrogenation catalyst at a temperature of between about 150° and 250° C. followed by recovery of the tris-(ether-amine) formed, the improvement consisting of using an amount of said catalyst between about 10 and 40 percent by weight based on the weight of the alkylene glycol mono-ether employed.

4,408,076

PHENOXY UNSATURATED CARBOXYLIC ACID ESTERS AND DERIVATIVES

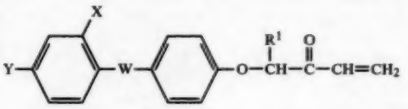
Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 270,938, Jun. 5, 1981, abandoned, and Ser. No. 196,795, Oct. 14, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,413

Int. Cl.³ C07C *43/205*

U.S. Cl. 568—325 **5 Claims**

1. A compound of the formula



wherein W is oxygen, R^1 is hydrogen or lower alkyl and each of X and Y is independently selected from hydrogen, bromo, chloro, fluoro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, nitro, cyano, trifluoromethyl, chlorodifluoromethyl, fluoromethyl, chloromethyl and difluoromethoxy.

4. The compound, 4-[4-(4-trifluoromethyl phenoxy)phenoxy]-3-oxo-1-pentene, according to claim **1**.

4,408,077

6-(LOWER ALKOXY)-5-(TRIFLUOROMETHYL)-1-NAPHTHALENECARBOXALDEHYDES

Kazimir Sestanj, St. Laurent; Steven Fung, Montreal; Nedumparambil A. Abraham, Dollard des Ormeaux, and Francesco Bellini, Mount Royal, all of Canada, assignors to Ayerst, McKeena & Harrison, Inc., Montreal, Canada

Filed Nov. 13, 1981, Ser. No. 321,302

Int. Cl.³ C07C *47/115*

U.S. Cl. 568—441 **2 Claims**

1. 6-(Lower alkoxy)-5-(trifluoromethyl)-1-naphthalenecarboxaldehyde.

4,408,078

PROCESS FOR THE HYDROFORMYLATION OF OLEFINS

Petrus W. N. M. Van Leeuwen, and Cornelis F. Roobeek, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 16, 1982, Ser. No. 399,161

Claims priority, application United Kingdom, Dec. 23, 1981, 8138734

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **18 Claims**

1. A process for the hydroformylation of olefins having carbon numbers up to 20 carbon atoms to aldehydes and alcohols which process comprises contacting at a temperature ranging from about 50° C. to about 180° C. and a pressure of up to about 200 bar said olefins with carbon monoxide and hydrogen in a molar ratio between about 12:1 to about 1:12 in the presence of a ligand-stabilized, platinum-containing catalytic system comprising at least one secondary phosphine moiety.

4,408,079

PREPARATION OF ALPHA-ALKYLACROLEINS

Franz Merger, Frankenthal, and Hans-Juergen Foerster, Bobenheim-Roxheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,505
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1981, 3106557
Int. Cl.³ C07C *47/22*
U.S. Cl. 568—463 10 Claims

1. A process for the preparation of an α-alkylacrolein of the formula

$$CH_2=C(R^1)-CHO \quad I$$

where R^1 is an aliphatic radical, by reacting an alkanal of the formula

$$R^1\text{-}CH_2\text{-}CHO \quad II$$

where R^1 has the above meaning, with formaldehyde and a secondary amine in the presence of an acid, wherein the reaction is carried out with a molar ratio of starting material II to formaldehyde of 0.9–1.5:1, at a pH of 2.5–7 and at form 0° to 150° C. in the presence of

(a) between 0.05 and 1.5 equivalents of an aliphatic monocarboxylic acid of 2 to 10 carbon atoms per mole of starting material II or

(b) between 0.3 and 1.25 equivalents of a dicarboxylic or polycarboxylic acid of 2 to 10 carbon atoms per mole of starting substance II, as the acid, and in the presence of a secondary amine, using an equivalent ratio of carboxylic acid to amine of 1–2:1.

4,408,080

PROCESS FOR PRODUCING ACETALDEHYDE

Nobuo Isogai; Motoyuki Hosokawa; Takashi Okawa; Natsuko Wakui, and Toshiyasu Watanabe, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,360
Claims priority, application Japan, Jun. 18, 1980, 55-82299
Int. Cl.³ C07C *47/06, 45/49*
U.S. Cl. 568—484 5 Claims

1. In a process for producing acetaldehyde which comprises reacting a mixture of methanol and methyl acetate with carbon monoxide and hydrogen in the presence of a cobalt-iodine catalyst, the improvement wherein methyl acetate is used in an amount of 0.5 to 4 parts by weight per part by weight of methanol, cobalt and iodine are used in an amount of 2 to 100 milligram-atoms and 8 to 200 milligram-atoms, respectively, per mole of the entire methyl groups in the methanol and methyl acetate, 1 to 4 iodine atoms being present per cobalt atom, and the reaction is carried out at a temperature of from 80° to 160° C. and a pressure of from 50 to 300 kg/cm².

4,408,081

PROCESS FOR OXIDATION OF ISOBUTANE

Elton G. Foster, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 5, 1981, Ser. No. 308,629
Int. Cl.³ C07C *179/02*
U.S. Cl. 568—571 9 Claims

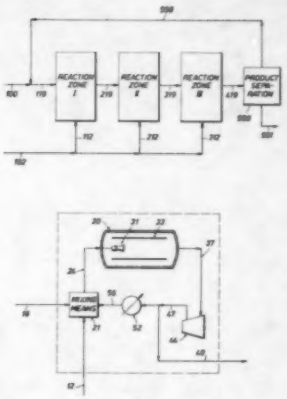
1. In the preparation of tertiary-butyl hydroperoxide by the direct oxidation of isobutane in dense-phase reaction mixture at a reaction temperature in the range from about 140° C. to 170° C. and at a reaction pressure in excess of the critical pressure of the mixture and greater than about 700 psig, the improvement which comprises the steps of:

(a) conducting a plurality of essentially steady-state isobutane oxidation reactions, each reaction in one of a series of reaction zones, each zone containing an agitated dense-phase oxidation reaction mixture,

(b) introducing a continuous flow of isobutane reactant into the mixture of the first zone of the series,

(c) introducing a continuous flow of oxygen reactant into the mixture of each zone of the series,

(d) withdrawing continuous flows of reaction mixture from each zone of the series, and



(e) introducing each of the withdrawn flows into the mixture of the zone that is next subsequent to the one from which it is withdrawn, with the provision that the flow withdrawn from the last zone of the series is taken from the process as a tertiary-butyl hydroperoxide containing product mixture characterized by a conversion of isobutane of between about 3 and 25 percent.

4,408,082

OXIDATION OF ISOBUTANE IN THE DENSE PHASE AND AT LOW OXYGEN CONCENTRATION

Herman J. Baumgartner, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 5, 1981, Ser. No. 308,630
Int. Cl.³ C07C *179/02*
U.S. Cl. 568—571 8 Claims

1. In a process for the preparation of tertiary-butyl hydroperoxide by the direct oxidation of isobutanes which comprises reacting isobutane with molecular oxygen in a dense phase reaction mixture at a reaction temperature in the range from about 140° C. to 170° C. and at a reaction pressure above the critical pressure of the mixture and above 525 psig, the improvement which comprises limiting the oxygen concentration in the mixture to less than 0.1%M, and controlling said reaction to afford an overall isobutane conversion of from about 5 to about 20%M.

4,408,083

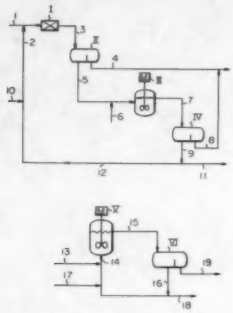
METHOD OF TREATING HYDROPEROXIDE MIXTURES

Masakazu Toyoura; Koichi Shomura, both of Iwakuni; Hirotoshi Tsuchida, and Tadateru Murakami, both of Otake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 17, 1981, Ser. No. 293,510
Claims priority, application Japan, Aug. 19, 1981, 56-113028
Int. Cl.³ C07C *179/02*
U.S. Cl. 568—576 20 Claims

1. A method of treating hydroperoxide mixtures, which comprises contacting an oily hydroperoxide mixture containing (A) a primary aromatic benzene or naphthalene hydroper-

oxide having a hydroperoxymethyl group directly bonded to the aromatic benzene or naphthalene nucleus and (B) a tertiary aromatic benzene or naphthalene hydroperoxide having a 2-hydroxyperoxy-2-propyl group bonded directly to the aromatic benzene or naphthalene nucleus with an aqueous alkali solution having a pH value of 12 to 14 thereby to form an aqueous layer wherein the ratio of A/(A+B) in the aqueous



layer is higher than the ratio of A/(A+B) in the starting oily mixture and an oily layer wherein the A/(A+B) in the oily layer is lower than the ratio of A/(A+B) in the starting oily mixture, separating the aqueous layer from the oily layer, and decomposing at least a part of the primary aromatic hydroperoxide (A) in the aqueous layer by heating the aqueous layer at a temperature higher than the temperature used for said contacting with the aqueous alkali solution.

4,408,084

NON-IONIC SURFACTANTS CONTAINING ACETAL GROUPS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

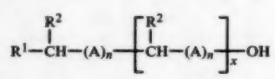
Filed Jan. 9, 1981, Ser. No. 223,880

The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.

Int. Cl.³ C07C *2/76, 1/00*

U.S. Cl. 568—601 **7 Claims**

1. A composition of matter having the formula:



wherein R^1 is the residue of at least one hydrophobic monofunctional organic compound derived from a compound selected from the group consisting of an aliphatic alcohol; an alkylarylalkyl alcohol; alkoxylated derivatives of each of the foregoing; and an alkoxylated alkylphenol; wherein R^2 is hydrogen or alkyl of 1 to 4 carbon atoms, A is the residue of (1) at least one hydrophilic oxyalkylene polymer derived from different alkylene oxides, or (2) different hydrophilic oxyalkylene polymers, at least one of said polymers being derived from different alkylene oxides wherein said alkylene oxides have 2 to 4 carbon atoms and said polymers are the reaction product of said alkylene oxides with an active hydrogen hydroxyl group-containing compound having at least 2 active hydrogen atoms, x is an integer of 1 to 20, and n is individually selected from integers such that the molecular weight is up to about 1000.

4,408,085

PROCESS FOR PREPARING SEC-BUTYL ALCOHOL AND SEC-BUTYL TERT-BUTYL ETHER

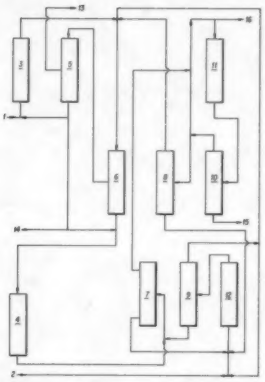
Klaus Gottlieb, Herdecke-Ende, and Wilfried Graf, Dorsten, both of Fed. Rep. of Germany, assignors to VEBA OEL AG, Gelsenkirchen-Buer, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,803

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116780

Int. Cl.³ C07C *41/06, 29/86*

U.S. Cl. 568—697 **9 Claims**



1. A process for producing sec-butanol and sec-butyl tert-butyl ether from butane comprising:

(a) partially isomerizing n-butane to produce a mixture of n-butane and isobutane;

(b) catalytically dehydrogenating the mixture of n-butane and iso-butane from step (a) to produce a mixture containing at least butene-1, iso-butene and butadiene;

(c) selectively hydrogenating and hydroisomerizing the mixture from step (b) so as to convert at least a part of the butadiene to butene-1 and to convert essentially all of the butene-1, that from the dehydrogenation step (b) and from the selective hydrogenation of butadiene, to butene-2, whereby a mixture of C_4-hydrocarbons is produced which contains at least unreacted isobutene from step (b) and butene-2;

(d) etherifying at least a part of the isobutene contained in the mixture obtained from step (c) with sec-butanol to form a mixture containing at least sec-butyl tert-butyl ether and unreacted hydrocarbons, including butene-2;

(e) converting at least a part of the butene-2 contained in the unreacted hydrocarbons of step (d) to sec-butanol by a hydration reaction;

(f) recycling the sec-butanol of step (e) to the etherification step (d);

(g) recovering the sec-butyl tert butyl ether reaction product of step (d).

4. The process according to claim **1** or **2** wherein unconverted sec-butanol is extracted from the etherification reaction product mixture of step (d) by treating said mixture with water.

4,408,086

OLIGOMERIZATION OF M-ISOPROPENYLPHENOL

Shunsuke Matsushima, Otsu; Kazuhiko Hata, Niihama; Kentaro Mashita, Ibaraki; Shuichi Kanagawa, Osaka; Shinji Nakao, Sakai; Kiyoshi Nakai, and Kunimasa Kamio, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 24,424, Mar. 27, 1979, Pat. No. 4,260,831. This application Dec. 3, 1980, Ser. No. 212,511

Claims priority, application Japan, Apr. 3, 1978, 53-39599; Apr. 4, 1978, 53-40090

Int. Cl.³ C07C *39/14, 37/14*

U.S. Cl. 568—719 4 Claims

1. A solid state oligomerization process, which comprises freezing m-isopropenylphenol at a temperature of from −120° to 20° C., in the presence of an oligomerizaion catalyst selected from the group consisting of boron trifluoride, boron trifluoride etherate, boron trifluoride alcoholate, boron trifluoride phenolate, sulfuric acid, phosphoric acid, alkylphosphoric acid, alkylbenzenesulfonic acid, naphthalenesulfonic acid, monoalkyl sulfate, aluminum trichloride and iron chloride, said catalyst being present in the amount of 0.01 to 3% by weight of m-isopropenylphenol.

4. An oligomer obtained by the process of claim 1.

4,408,087

PURIFICATION OF BISPHENOL-A

Ming K. Li, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1979, Ser. No. 88,768

Int. Cl.³ C07C *29/92, 29/78*

U.S. Cl. 568—724 3 Claims

1. The method of recovering 2,2-bis(4-hydroxyphenyl)propane in a purified state from a mixture of the latter and impurities derived from the acid condensation of phenol and acetone which comprises:

(1) combining a mixture of (a) an adduct of phenol and said 2,2-bis(4-hydroxyphenyl)propane and (b) impurities associated with (a), with from 1 to 4 parts, by weight, water per weight part of adduct,

(2) heating the mixture of the adduct and water at a temperature from 85° to 110° C., to break said adduct and form a two-phase liquid aqueous-organic system,

(3) separating the organic phase containing said 2,2-bis(4-hydroxyphenyl)propane from the aqueous phase formed in (2) while the two phases are at an elevated temperature,

(4) adding the organic phase an amount of water less than that used in step (1), wherein the water and organic phase mixture is at a temperature of at least 85° C., and

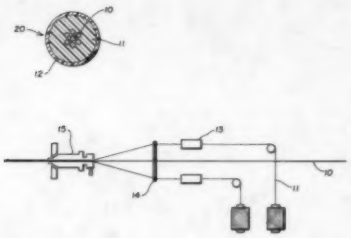
(5) cooling the mixture to precipitate said 2,2-bis(4-hydroxyphenyl)propane in a highly purified state.

4,408,088

ARAMID REINFORCED THERMOCOUPLE CABLE

Danny R. Foote, Spirit Lake, Iowa, assignor to Berkley and Company, Inc., Spirit Lake, Iowa

Filed Feb. 10, 1982, Ser. No. 347,524
Int. Cl.³ H01F 35/28
U.S. Cl. 136—226 5 Claims



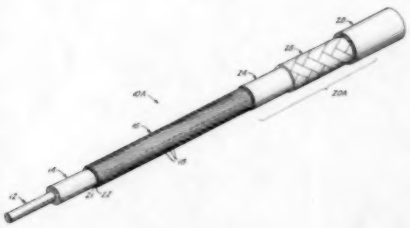
1. A thermocouple cable comprising:
thermocouple wires in parallel relation;
a pultrusion of aramid fibers concentrically layered over said thermocouple wires; and
an extruded water impervious abrasion resistant layer over said aramid fibers and said thermocouple wires.

4,408,089

EXTREMELY LOW-ATTENUATION, EXTREMELY LOW RADIATION LOSS FLEXIBLE COAXIAL CABLE FOR MICROWAVE ENERGY IN THE GIGAHERTZ FREQUENCY RANGE

Charles E. Nixon, 224 Edwards Ave., Sayville, N.Y. 11782

Continuation-in-part of Ser. No. 95,179, Nov. 16, 1979, abandoned, which is a continuation of Ser. No. 970,191, Dec. 18, 1978, abandoned, which is a continuation of Ser. No. 842,072, Oct. 14, 1977, abandoned. This application Jun. 9, 1981, Ser. No. 271,770
Int. Cl.³ H01B 11/18
U.S. Cl. 174—34 9 Claims



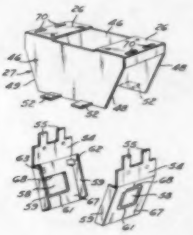
1. A low-attenuation flexible high frequency coaxial cable capable of use at higher frequencies above 10 gigaHertz comprising:
a center solid single-strand conductor extending longitudinally of the cable along the axis of the cable,
a flexible solid dielectric medium surrounding said center conductor,
a plurality of longitudinally extending parallel conductive elements adjacent one to another and in electrical contact one with another and adjacent to the outside of said dielectric medium for defining the outer conductor of the coaxial cable concentric to said center conductor and electrically conductively encircling said dielectric medium,
said parallel conductive elements comprising at least two layers extending nearly parallel with the length of said cable adjacent one to another and each having a very slight helical lay extending in the same direction about said dielectric medium along the entire length of said cable for assuring that said conductive elements are uniformly distributed around said dielectric medium,
means tightly surrounding said outer conductor for retaining said parallel conductive elements tightly pressed against the outside of said dielectric medium and against one another in electrical contact with one another, and
an outer jacket over said retaining means.

4,408,090

TRIMLESS CARPET BASE INSERT DEVICE

John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Nutley, N.J.

Filed Jan. 23, 1981, Ser. No. 227,757
Int. Cl.³ H02G 3/28
U.S. Cl. 174—48 7 Claims



1. An assembly for providing passageways for access to cables in cells in a cellular raceway, which cellular raceway includes raceway sections comprised of opposed side walls of, and a floor section between, adjacent pairs of cells, each raceway section including a plurality of raceway sub-sections each having opposed access openings in the opposed cell side walls, each access opening having a perimeter, which assembly is adapted to form grommet-like surfaces about the perimeter of the opposed pair of access openings in a raceway sub-section, which assembly comprises:
(a) a frame member, having a passageway therein for passage of cables therethrough, and including means for positioning the frame member in one of the plurality of sub-sections of the raceway, adapted to generally complementarily register with the raceway sub-section, and further including means engagable generally complementarily with other means to form the assembly; and
(b) a pair of end members, each adapted to be positioned in one of the plurality of raceway sub-sections, including means for forming a grommet-like surface about the perimeter in each of an opposed pair of access openings in the raceway sub-section, and means for interconnecting each side member to the frame member, adapted to be generally complementarily engagable with the engagable means of the frame member.

4,408,091

DEVICE AT CABLE ENDS TO SERVE AS A PREPARATION FOR SPLICING

Hans Laar, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 30, 1981, Ser. No. 258,905
Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019640
Int. Cl.³ H02G 1/14, 15/02
U.S. Cl. 174—74 R 9 Claims

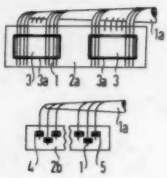
8. In combination, a large capacity cable including two cable ends and a plurality of wires extending between said ends; and at one of said ends, a device for holding the ends of the wires, including

at least one flexible support including means for receiving and holding the ends of the wires in a predetermined spaced relationship, said support having dimensions for insertion into conventional conduits,

said support comprising a pair of stretch-proof flexible strips areally bonded together and holding the wire ends immobile therebetween, said flexible strips including a pair of aligned apertures in the areas of said wires for access to said wires, and

each of said wires being exposed by a respective pair of said apertures.

9. In combination, a large capacity cable including two cable ends and a plurality of wires extending between said ends; and



at one of said ends, a device for holding the ends of the wires, including

at least one flexible support including means for receiving and holding the ends of the wires in a predetermined spaced relationship, said support having dimensions for insertion into conventional conduits,

said support comprising a pair of stretch-proof flexible strips areally bonded together and holding the wire ends immobile therebetween, said flexible strips including a pair of aligned apertures in the areas of said wires for access to said wires, and

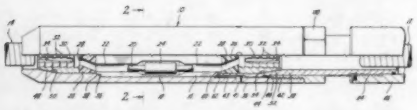
each pair of said aligned apertures exposing a respective plurality of said wires.

4,408,092

ELECTRICAL FEEDTHROUGH

William D. Eatwell, and James K. Garner, Jr., both of Houston, Tex., assignors to Cameo, Incorporated, Houston, Tex.

Filed Feb. 4, 1982, Ser. No. 345,897
Int. Cl.³ H02G *15/117*
U.S. Cl. 174—88 R **5 Claims**



1. An electrical power feedthrough for supporting and sealing a well electrical cable connection comprising,

a sealing insulator having a cavity for holding and sealing an electrical connection,

a sealing grommet at each end of the insulator for aligning the electrical cable with the insulator,

a cable gripping retainer adjacent each grommet end remote from the insulator,

a housing surrounding the insulator, grommets, and retainers, said housing including first and second telescoping housing parts,

means for telescoping the first and second parts together, and

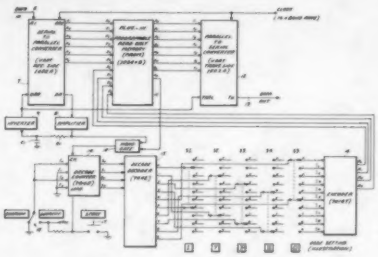
coacting wedge means between each of the housing parts and one of the retainers for causing the retainers to grip the cable when the first and second housing parts are telescoped together.

4,408,093

CRYPTOGRAPHIC ENCODER-DECODER

Harry Place, Ridgewood, N.J., assignor to ITT Industries, Inc., New York, N.Y.

Filed Jun. 5, 1981, Ser. No. 270,694
Int. Cl.³ H04K *1/00*
U.S. Cl. 178—22.19 **33 Claims**



1. A cryptographic encoder-decoder comprising:

a parallel addressable memory means capable of being changed storing therein a plurality of different predetermined encryption-decryption character code groups addressed by parallel input data; and

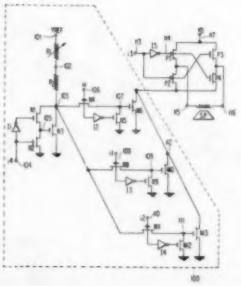
first means coupled to said memory means to establish a unique code and to select appropriate ones of said plurality of code groups as determined by said unique code to provide in response to said input data from said selected one of said plurality of code groups parallel output data from said memory means.

4,408,094

OUTPUT CIRCUIT

Toshio Oura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1980, Ser. No. 197,431
Claims priority, application Japan, Oct. 16, 1979, 54-133118
Int. Cl.³ H03K *13/02*
U.S. Cl. 381—120 **9 Claims**



1. An output circuit comprising:

a speaker having first (**115**) and second (**116**) input terminals;

a voltage terminal (GND);

a first node (**103**);

a second node (**112**);

variable means (R1 or D/A) for providing a variable bias current to said first node;

a first field effect transistor (N3) having a gate and a source-drain conduction path and controlling the conductivity of said source-drain conduction path in accordance with the voltage at said gate, said source-drain conduction path of

said first field effect transistor being coupled between said first node and said voltage terminal;

connection means (N1) for electrically connecting said gate of said first field effect transistor to said first node;

a plurality of current source transistors (N6, N10, N13) each having a gate and a source-drain conduction path and each controlling the conductivity of its source-drain conduction path in accordance with the voltage at its gate, said source-drain conduction paths of said plurality of current source transistors being coupled in parallel with one another between said second node and said voltage terminal;

a plurality of transfer field effect transistors (N4, N8, N11) each having a gate and a source-drain conduction path and each varying the conductivity of its source-drain conduction path in accordance with the voltage at its gate, the source-drain conduction paths of each of said plurality of transfer field effect transistors each being coupled between said first node and the gate of a respective one of said current source transistors and each receiving at its gate a respective one of a plurality of digital signals (i_0, i_1, i_2);

a first terminal (113) receiving a first frequency signal (i_3);

a second terminal (114) receiving a second frequency signal having an opposite phase to said first frequency signal;

a further voltage terminal (117); and

first (P1), second (P2), third (P3) and fourth (P4) switch field effect transistors each having a gate and a source-drain conduction path and each varying the conductivity of its source-drain conduction path in accordance with the voltage at its gate, said first switch field effect transistor (P1) having its source-drain conduction path coupled between said first input terminal of said speaker and said further voltage terminal and having its gate coupled to said second terminal, said second switch field effect transistor (P2) having its source-drain conduction path coupled between said first input terminal of said speaker and said second node and having its gate coupled to said first terminal, said third switch field effect transistor (P3) having its source-drain conduction path coupled between said second input terminal of said speaker and said further voltage terminal and having its gate coupled to said further terminal, and said fourth switch field effect transistor (P4) having its source-drain conduction path coupled between said second input terminal of said speaker and said second node and having its gate coupled to said second terminal.

4,408,095

ACOUSTIC APPARATUS

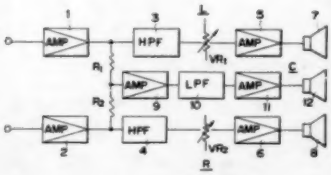
Shoji Ariga, and Tadashi Tomita, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,877

Claims priority, application Japan, Mar. 4, 1980, 55-27944[U]

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—24 **4 Claims**



1. An acoustic apparatus which comprises:

a left-channel reproducing means including a high-pass filter for outputting middle and high frequency components from a left-channel signal;

a left-channel speaker driven by said left-channel reproducing means for reproducing said left-channel middle and high frequency components;

a right-channel reproducing means including a high-pass filter for outputting middle and high frequency components from a right-channel signal;

a right-channel speaker driven by said right-channel reproducing means for reproducing said right-channel middle and high frequency components;

in intermediate-channel reproducing means including a mixing circuit for mixing said left- and right-channel signals and a low-pass filter for outputting low-frequency component from the mixed left- and right-channel signal; and

a low-frequency speaker driven by said intermediate-channel reproducing means for reproducing said mixed left- and right-channel low-frequency component;

the reproduction power of the middle and high frequency components outputted from the left- and right-channel reproducing means being set lower than the reproduction power of the low frequency component outputted from the intermediate-channel reproducing means, wherein each of the left- and right-channel reproducing means includes buffer amplifiers before and after said high-pass filter, respectively.

4,408,096

SOUND OR VOICE RESPONSIVE TIMEPIECE

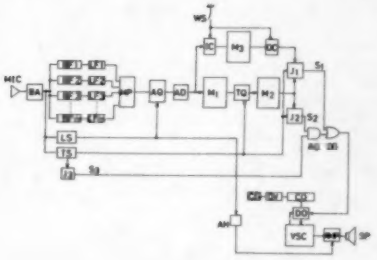
Isamu Washizuka, and Mitsuhiro Saiji, both of Kyoto, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1981, Ser. No. 247,054

Claims priority, application Japan, Mar. 25, 1980, 55-38753

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—107 **1 Claim**



1. A timepiece comprising:

means for receiving sound;

means for setting said timepiece in a first or second mode of operation;

means for storing at least one first sound received by said sound receiving means when said timepiece is in said first mode of operation;

means for comparing second sounds received by said sound receiving means when said timepiece is in said second mode of operation with said at least one first sound;

means for providing a signal when said second sounds are the same as said at least one first sound;

means for providing an audible indication of time information in response to said signal; and

means for varying the amplitude of said audible indication of time information in response to the amplitude of said second sounds.

4,408,097
AM-FM RADIO RECEIVER FOR RECEIVING AM-STEREO SIGNALS

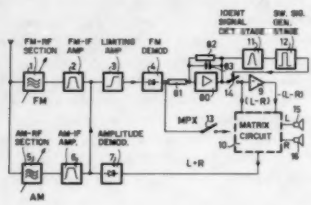
Bahne P. Bahnsen, Henstedt-Ulzburg, and Willy Kanow, Schenefeld, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1981, Ser. No. 259,797

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024085

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—15 **1 Claim**



1. An AM-FM radio receiver having an FM-RF section and an AM-RF section each coupled to an aerial input, an FM intermediate frequency amplifier coupled to said FM-RF section, an AM intermediate frequency amplifier coupled to said AM-RF section, an FM demodulator coupled to said FM intermediate frequency amplifier by a limiting amplifier, an amplitude demodulator coupled to said AM intermediate frequency amplifier, and a matrix circuit coupled to both said FM and amplitude demodulators, characterized in that on the reception of AM-stereo signals in which a sum signal (L+R) is amplitude modulated on a carrier wave and a difference signal (L−R), together with a stereo program identification signal, is phase modulated on the same carrier wave, said FM demodulator is further coupled to said AM intermediate frequency amplifier, said FM demodulator comprising a network having two serially connected parallel resonant circuits, one tuned to the FM intermediate frequency and the other tuned to the AM intermediate frequency, and said receiver further comprising an integrating circuit coupled to the output of said FM demodulator, for forming said difference signal (L−R), an identification signal detection stage connected to said integrating circuit, a switching signal generating stage connected to the output of said detection stage, and switching means, having a control input coupled to said switching signal generating stage, for connecting said integrating circuit to said matrix circuit in which separate left and right stereo signals are formed from the sum signal of the amplitude demodulator and the difference signal of the integrating circuit.

4,408,098
RECEIVER WITH FIELD-STRENGTH DEPENDENT NOISE REDUCTION CONTROL

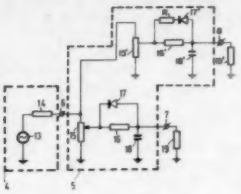
Theodor I. E. Kamalski, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 18, 1981, Ser. No. 274,979

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—11 **5 Claims**

1. A receiver comprising a field-strength detector for measuring the received signal amplitude and a noise reduction circuit connected thereto via control signal generating means for reducing audio-frequency noise in the output signal of the receiver, which control signal generating means has an attack time constant at a decrease of the received signal amplitude measured by the field-strength detector, and a recovery time constant at an increase of the received signal amplitude, said recovery time constant being greater than the attack time constant, the noise reduction circuit comprising a continuously variable tone control circuit and a continuously variable mono-stereo control circuit, these two circuits being connected to the control signal generating means for a gradual control during at least an increase of the field strength, characterized in that said control signal generator means comprises a first control signal generating circuit, connected to the continuously variable mono-stereo control circuit of the noise reduction circuit, which applies thereto a mono-stereo control signal which varies continuously versus the field strength having an attack time constant of not more than 40 msec. and a recovery time



constant of at last 200 msec., and said control signal generating means further comprises a second control signal generating circuit, connected to the continuously variable tone control circuit of the noise reduction circuit, which applies thereto a tone control signal which continuously varies versus the field strength with a recovery time constant of at least 300 msec. and an attack time constant of not more than 0.8 times the recovery time constant.

4,408,099
RADIO PAGING SYSTEM CAPABLE OF ACCEPTING MESSAGE WITH ACCESS OF PAGING RECEIVER

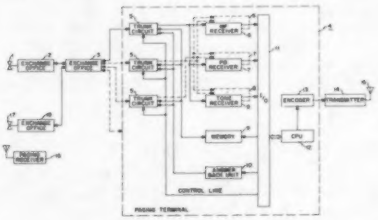
Daisuke Ishii, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 5, 1981, Ser. No. 270,992

Claims priority, application Japan, Jun. 13, 1980, 55-80025

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—2 EC **10 Claims**



1. A radio paging method for calling a paging receiver from a telephone set by way of a paging terminal, said method comprising the steps of:

(a) sending a paging signal assigned to a paging receiver together with a message, said sending being from a first telephone set to a paging terminal;

(b) transmitting said paging signal from said paging terminal over a radio frequency to said paging receiver;

(c) storing said message at said paging terminal;

(d) receiving, at said paging receiver, said paging signal transmitted by said step (b);

(e) pre-storing the paging number for said paging receiver in said paging receiver;

(f) sending tones corresponding to the pre-stored paging number (e), said tones being sent from said paging receiver to said paging terminal by way of a second telephone set; and

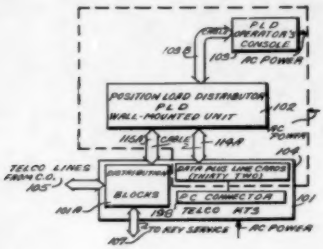
(g) sending said message stored by said step (c) to said second telephone set, in response to said tones of step (f).

4,408,100

POSITION LOAD DISTRIBUTION AND MANAGEMENT SYSTEM FOR KEY TELEPHONE SYSTEMS

George E. Pritz, Locust Grove, and Robert Novakowski, Fairfax, both of Va., assignors to Data Plus, Inc., Lorton, Va.

Filed Mar. 2, 1981, Ser. No. 239,347
Int. Cl.³ H04M 3/50, 5/06
U.S. Cl. 179—27 D 33 Claims



1. For use in combination with a key telephone system having a plurality of incoming telephone lines and a plurality of agent-serviced positions, an incoming call distribution and management system, comprising:

means in operative relationship with said telephone system for distributing incoming telephone calls among said agent positions to an available position having the longest idle time since its last on-line condition, by directing said available agent position to answer an incoming call; and

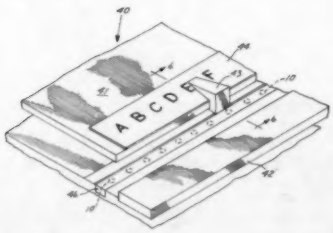
means in operative relationship with said distributing means and with said telephone system for automatically answering an incoming call if an agent position fails to answer said incoming call in a predetermined time or if all of said agent positions are busy.

4,408,101

AUTOMATIC TELEPHONE DIALING APPARATUS WITH MAGNETIC SWITCH ASSEMBLY

Robert M. Brodbeck, Littleton, Colo., assignor to Marcamor, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 193,658, Oct. 30, 1980. This application Apr. 16, 1982, Ser. No. 369,137
Int. Cl.³ H04M 1/274
U.S. Cl. 179—90 BD 8 Claims



1. In a telephone index and combined switch device for memory stored dialing data for automatic telephone dialing, the combination comprising:

multiple card index means including a plurality of cards one on another for visual listing of names and telephone numbers, each card including individual lines for individual names and telephone numbers, and finding means arranged for movement along a preestablished path of movement relative to said cards;

card switch means activated by positioning said finding means having a first mode and a second mode, said card switch means being connected in a first circuit arranged for engaging a latching circuit for an individual card, said first circuit being completed via said card switch means in said first mode and interrupted via said card switch means in said second mode, whereby, with a first card selection and with said card switch means in said first mode, the latching circuit for the first card selected remains in effect independently of the operation of said card switch means until said finding means is moved to a second card selection and said card switch means is in said first mode,

said card switch means including a plurality of magnetic flux actuated switching devices each including circuit connecting means for completing a circuit via each associated switching device when in the vicinity of a magnetic flux of a preselected strength, said switching devices being mounted at fixed positions with similarly oriented corresponding surfaces disposed along said preestablished path of movement of said finding means;

a single magnetic flux producing actuator movable with said finding means along said path in the vicinity of but not in physical contact with each switching device to provide a substantially uniform distance between said actuator and each switching device for applying substantially the same magnetic force on each switching device when that switching device is directly opposite said actuator during the movement of said actuator along said path while successively actuating said switching devices; and

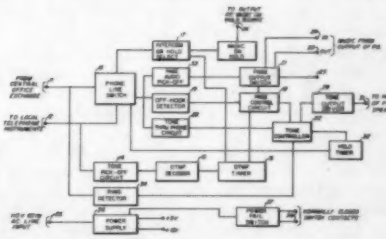
selector switch means operable separate and independent of said card switch means connected in a second circuit corresponding to a particular line and a particular card which, upon actuation after the card switch means is in the first mode, is effective to retrieve and automatically dial a telephone number stored at a location in a memory associated with said particular line.

4,408,102

TWO-WIRE EXCHANGE TELEPHONE SYSTEM

Steven B. Lumpkin, 164 Acadian Dr., Lafayette, La. 70503

Filed Apr. 27, 1981, Ser. No. 257,596
Int. Cl.³ H04M 1/72, 9/02
U.S. Cl. 179—99 H 11 Claims



1. A two wire telephone system, comprising:

first terminating means for connection to an incoming central office line;

second terminating means for connection to a local telephone instrument;

a DTMF timer circuit;

phone line switch means for selectively connecting said first and second terminating means;

means responsive to a preselected signal tone of a first preselected duration from said telephone instrument for actuating said DTMF timer circuit;

means responsive to a first value in said DTMF timer circuit for actuating said switching means to disconnect said first and second terminating means from one another and con-

nect said first terminating means to a conductive holding path and to a source of music signals; and

means responsive to said preselected signal tone of a first preselected duration from said local telephone instrument for disconnecting said first terminating means from said holding path and music signals and connecting it to said second terminating means.

4,408,103

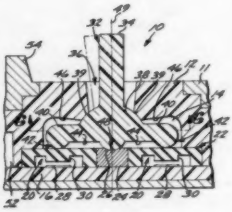
JOYSTICK OPERATED MULTIPLE POSITION SWITCH

Jay Smith, III, Pacific Palisades, Calif., assignor to Smith Engineering, Santa Monica, Calif.

Filed Jan. 6, 1982, Ser. No. 337,228

Int. Cl.³ H01H *13/70, 25/00*

U.S. Cl. 200—6 A **6 Claims**



1. A multiposition switch comprising:

a surface;

a plurality of contact regions on the surface each formed by a pair of first and second adjacent contacts of an electrical switch, one of which being a resilient member, said contacts being spaced apart and electrically insulated one from the other with said resilient member having an indented surface thereon which is spaced apart from the contact regions, and an electrical conductor in electrical contact with a common point for each of the electrical switches formed by the respective contact regions;

said plurality of conductive regions each being located within a separate hollow formed concentrically in the resilient material and thereby spaced apart from the surface, with the conductive region formed in a protrusion within each hollow;

a joy stick mounted in swiveling relation to the surface and having a manipulating rod and a plurality of urging members disposed radially outward from the longitudinal axis of the manipulating rod at generally the swivelingly mounted end of the joy stick, and corresponding in number and position to the number and position of the respective contact regions;

said joy stick, upon being actuated to depress the resilient member, moving at least one of the urging members towards the stationary contact regions, with the urging member aligned with a conductive region bringing this conductive region into contact with an aligned stationary contact region; and

the resilient member forming a donut shape about the swivelingly mounted end of the joy stick, with a hub of rigid material located at the center of the donut shaped resilient member and having formed thereon a swivel mounting surface for the swiveling mounting of the joy stick, said hub forming the electrical conductor in the resilient member.

4,408,104

LEVER SWITCH ARRANGEMENT FOR MOTOR VEHICLE

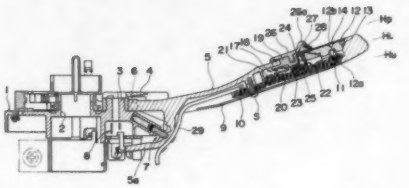
Masayosi Iwata, Hashima; Kenshi Furuhashi, Nagoya, and Hiroyasu Ito, Ichinomiya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 15, 1982, Ser. No. 358,603

Claims priority, application Japan, Mar. 27, 1981, 56-43896[U]

Int. Cl.³ H01H *9/16*

U.S. Cl. 200—61.54 **9 Claims**



1. A lever switch arrangement for use in a motor vehicle and the like, which comprises:

a base member securable around a steering shaft of the motor vehicle and having switch means therein;

a control lever pivotally connected to said base member for operating said switch means in said base member;

a light source in said control lever;

a light transmitting member on the outer end of said control lever for transmitting light from said light source;

a further switch means provided in said control lever;

an operating member provided on said control lever for operating said further switch means and being slidingly displaceable between a first position where said operating member overlaps a portion of said light transmitting member for hiding said portion from view and a second position where said operating member is out of overlapping relation with said portion of said light transmitting member so as to expose said portion; and

a display means provided at said portion of said light transmitting member for indicating a functional condition of said further switch means when said portion of said light transmitting member is exposed.

4,408,105

SEESAW SWITCH

Toshio Tanaka, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Nov. 19, 1981, Ser. No. 323,033

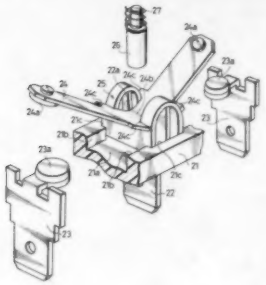
Claims priority, application Japan, Nov. 19, 1980, 55-166013

Int. Cl.³ H01H *1/22, 5/08*

U.S. Cl. 200—68 **5 Claims**

1. In a switch having a central terminal, stationary terminals disposed on respective sides of the central terminal, and a movable contact piece placed over the central terminal, the movable contact piece being movable pivotally so as to connect or disconnect the central terminal and a corresponding stationary terminal, the improvement wherein a receiver for the movable contact piece is provided with means including arcuate guide portions extending upwardly from opposite sides of said movable contact piece for supporting said movable contact piece against lateral movement during its pivotal movement, and said movable contact piece including engaging means adapted to ride along said arcuate guide portions

whereby said guide portions serve to support said movable contact piece laterally while providing a arcuate guide for

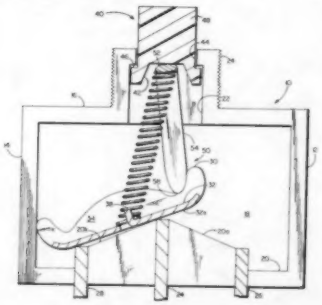


supporting said movable contact during its entire range of movement.

4,408,106
PUSHBUTTON SWITCH

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Mar. 22, 1982, Ser. No. 360,474
Int. Cl.³ H01H *13/28, 13/60*
U.S. Cl. 200—68 **16 Claims**

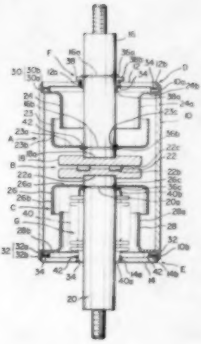


1. A pushbutton switch assembly comprising a switch housing having a boss defining an opening, a pushbutton slidably received in said opening for movement from and to a normal position, said housing having an internal cavity communicating with said opening, fixed contacts in the bottom wall of said housing cavity and including a center fixed contact having its upper end located above the upper end of another of said fixed contacts, a movable contact element in said cavity and having a lower surface in sliding engagement with said upper end of said fixed contact, strut means acting between said movable contact element and said pushbutton to cause pivotal movement of the contact element in response to downward movement of said pushbutton, a spring acting between said contact element and an upper end of said strut means to return said pushbutton to said normal position, said strut means having said upper end loosely received in a downwardly open recess in said pushbutton, and said contact element having an upper camming surface engaging the lower end of said strut means.

4,408,107
VACUUM INTERRUPTER

Shinzo Sakuma, Kawasaki; Eiji Umeya, Numazu; Junichi Warabi, Shizuoka; Yukio Kobari, and Hidemi Kawaguchi, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,862
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **22 Claims**



1. A vacuum interrupter comprising in combination:

an envelope including a cylindrical housing made of a metallic material, a disc-shaped upper end plate made of an inorganic insulating material having an aperture in the center portion thereof and a disc-shaped lower end plate made of an inorganic insulating material having an aperture in the center portion thereof;

an electrical contact member including a stationary contact rod inserted into said envelope through said aperture of the upper end plate, a stationary electrical contact secured to said stationary contact rod, a movable contact rod inserted into said envelope through said aperture of the lower end plate and a movable electrical contact secured to said movable contact

a shielding member for shielding the inner surface of said envelope;

a first sealing means for sealing hermetically said upper end plate to said housing and including a first auxiliary sealing member made of a plastic deformable metallic material which is deformable by the thermal stress and a metallized portion provided between said first auxiliary sealing member and said upper end plate;

a second sealing member for sealing hermetically said lower end plate to said housing and including a second auxiliary sealing member made of a plastic deformable metallic material which is deformable by the thermal stress and a metallized portion provided between said second auxiliary sealing member and said lower end plate;

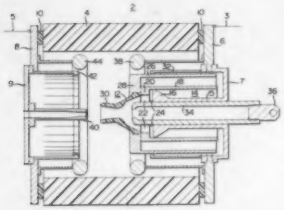
first supporting means for supporting and securing hermetically said stationary contact rod to said upper end plate including a metallized portion provided between said upper end plate and said stationary contact rod; and

hermetic seal means for sealing movably and hermetically said movable contact rod to said lower end plate including a bellows for securing said movable contact rod to said lower end plate and a metallized portion provided between said lower end plate and said bellows.

4,408,108
PUFFER TYPE GAS INTERRUPTER

Keizo Takatsuka; Hiroshi Yamamoto, and Toshihiro Baba, all of Amagasaki, Japan, assignors to Mutsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,603
Claims priority, application Japan, Apr. 25, 1980, 55-56629
Int. Cl.³ H01H *33/74*
U.S. Cl. 200—148 A 7 Claims



1. A puffer type gas circuit interrupter comprising an insulating housing containing therein an arc extinguishing gas;

a stationary contact assembly disposed within said housing and electrically connectable to an external circuit, and including a stationary arcing contact and a stationary main contact in conductive contact with said stationary arcing contact;

a movable contact assembly disposed within said housing and electrically connectable to an external circuit, said movable contact assembly including a movable arcing contact operable into and out of electrical contact with said stationary arcing contact;

a hollow puffer piston disposed within and secured to said housing, said movable arcing contact slidably extending through said hollow puffer piston;

a puffer cylinder secured to said movable arcing contact and slidable over said puffer piston for defining a puffer chamber therebetween and having an aperture for allowing the arc extinguishing gas to pass therethrough;

an insulating flow guide nozzle secured to said puffer cylinder for directing the arc extinguishing gas compressed within said puffer chamber toward an electric arc established between separated arcing contacts through said aperture in the puffer cylinder upon separation of said arcing contacts;

electrical conductor means rigidly connected to said puffer cylinder with a space disposed therebetween, said electricl conductor means being in conductive contact with said movable arcing contact, said conductor means being movable together with said arcing contact into and out of contact with said stationary main contact, said conductor means separating from said stationary main contact before said arcing contacts separate; and

a cluster of stationary finger contacts connectable to the external circuit and disposed around said conductor means for a permanent relative sliding electrical contact thereto.

4,408,109
LATCH DOWN DEVICE FOR PUSH-BUTTON SWITCHES

Gursharan P. S. Nat, Smithfield, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 13, 1981, Ser. No. 321,002
Int. Cl.³ H01H *13/56*
U.S. Cl. 200—153 J 16 Claims

1. In a push-button switch comprising:

a housing having an opening therein;

a push-button mounted in said opening and having a stem extending into said housing;

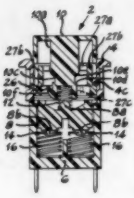
spring means biasing said push-button outwardly of said housing; and

switch contacts in said housing operable by said push-button;

the improvement comprising:

a leaf spring mounted in said housing and extending across said opening, said leaf spring being mounted under compression to be bistable and being biased against said push-button stem in one stable position;

a latching surface on said stem;



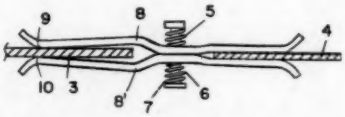
wherein depression of said push-button to an intermediate position operates said switch contacts to an ON condition and moves said latching surface inwardly of said leaf spring, said leaf spring engaging said latching surface to hold said push-button depressed in said intermediate position and said switch contacts operated in said ON condition, and

means subsequently operable by said push-button for removing said leaf spring from said latching surface for releasing said push-button.

4,408,110
ALUMINUM ELECTRICAL CONTACTS AND METHOD OF MAKING SAME

Michel Ladet, Grenoble; Jacques Lefebvre, Voiron, and Jos Patrie, Grenoble, all of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Continuation of Ser. No. 25,488, Mar. 30, 1979, abandoned. This application Jan. 7, 1981, Ser. No. 222,975
Claims priority, application France, Mar. 31, 1978, 7810333
Int. Cl.³ H01H *1/04*
U.S. Cl. 200—263 5 Claims



1. A device for establishing an electrical connection in an electrical circuit subjected to relatively high amperage current flow in which at least two conductive elements adapted to be brought into electrical contact, wherein at least one of the conductive elements includes an aluminum substrate having a surface free of oxide at least in a zone which is juxtaposed a zone which is to come in contact with another of said at least two conductive elements, said oxide free surface being produced by the deposition of a transient nickel coating by chemical displacement in an aqueous bath comprising:

HF	5 to 50 g/l
H_3BO_3	10 to 60 g/l
$NiCl_2.6H_2O$	50 to 500 g/l.

and subsequent dissolution of the transient nickel coating, and an electrolytically deposited layer of essentially pure nickel adhered without an intermediate layer directly to the so produced oxide free surface of the aluminum substrate and

wherein there is negligible diffusion of the electrolytically deposited nickel layer into the aluminum substrate.

4,408,111

INTERNAL LOCKING ARRANGEMENT FOR A SWITCH MACHINE

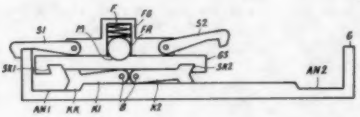
Gerold Domhan, Stuttgart; Franz Hartl, Keltern-Dietenhausen, and Kurt Vogelgsang, Rutesheim, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 28, 1981, Ser. No. 267,955

Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020788

Int. Cl.³ H01H *1/52, 9/00, 9/20*

U.S. Cl. 200—318 **6 Claims**



1. In a switch machine connected by two throw rods to the respective switch points to be operated and including a driving unit, a casing, a sliding member in the casing operatively connected to the throw rods for movement therewith in the directions of movement of the switch points, a displacement member displaceable by the driving unit in the casing in the aforementioned directions between two limiting positions, and means for releasably connecting the sliding and displacement members with one another for joint movement, including a depression in one of the members and a spring-loaded connecting element mounted on the other member and engageable in the depression,

an internal locking arrangement in the casing comprising:

means for releasably arresting the displacement member in said limiting positions thereof;

means for transmitting forces between the sliding member, the casing and the throw rods and for holding the latter in respective end positions thereof relative to the casing including

means for delimiting a gap between the sliding member and the casing, including mutually facing delimiting surfaces on the sliding member and on the casing bounding said gap and spaced by a predetermined distance from one another,

at least two holding elements situated in said gap and each pivotally mounted on one of the throw rods and having at least two projections each extending toward one of said delimiting surfaces to such an extent that the dimension of the respective holding element measured across said projections exceeds said predetermined distance, and

means for defining in the sliding member and in the casing respective recesses which open onto the respective limiting surfaces and are arranged to receive the respective projections of the respective holding elements therein.

4,408,112

WELDING INSERT RING AND METHOD OF WELDING THEREFOR

Gasparas Kazlauskas, 4455 Los Feliz, Apt. 1108, Los Angeles, Calif. 90027

Filed Jun. 12, 1981, Ser. No. 273,206

Int. Cl.³ B23K *31/06, 9/02*

U.S. Cl. 219—61 **9 Claims**

1. The method of welding abutting edges of a pair of in-line pipes comprising the steps of:

locating an inner insert ring between said edges directly adjacent the interior surface of said pipes;

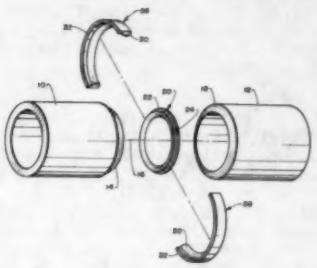
performing a root pass weld of said inner insert ring to said pipes;

locating an outer insert ring between said pipes and exteriorly of said inner insert ring;

welding of said outer insert ring to one of said pipes; and

performing a complete welding of said outer insert ring by fusing of said outer insert ring to said pipes.

6. In combination with a pair of in-line substantially abutting pipes, an insert ring to facilitate the welding together of said



pair of in-line substantially abutting pipes, said in-line pipes forming an annular recess at their abutted ends, said insert ring comprising:

a main section to be located within said annular recess; and

a flange extending from said main section, said flange being substantially equal to the length of said main section, said flange to be located against the exterior surface of one of said pipes, said flange is to be welded to said one of said pipes and then said main section is to be melted to fill said annular recess thereby welding together said pipes.

4,408,113

ELECTRICAL MACHINING APPARATUS

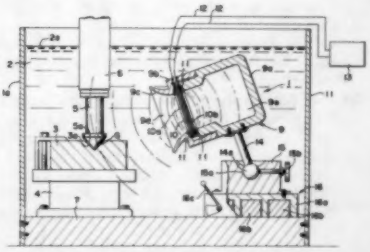
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Continuation-in-part of Ser. No. 4,987, Jan. 19, 1979, Pat. No. 4,289,947. This application Oct. 30, 1980, Ser. No. 202,232

Claims priority, application Japan, Mar. 2, 1978, 53-25633; Aug. 28, 1978, 53-117434

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 M **18 Claims**



1. An electrical machining apparatus having a worktank for containing a machining liquid and having a workpiece immersed therein, and a tool electrode positionable to be juxtaposed with the workpiece in the worktank to define an electrical machining gap therebetween filled with the machining liquid, said apparatus including:

an ultrasonic assembly disposed in said worktank and com-

prising a head member and a support member, said head member being constituted by a housing means having an ultrasonic transducer element supported therein and an opening for permiting only one of the two opposite side surfaces of said transducer element to be held in contact with the machining liquid and to communicate with the region of said electrical machining gap via the machining liquid, the head member being supported in the machining liquid by said support member to direct said opening selectively towards the region of said machining gap; and

a power supply for energizing said transducer element to produce ultrasonic vibrations therein and to impart the vibrations to the machining liquid in contact with said one side surface thereof, thereby transmitting the imparted ultrasonic vibration at least preferentially to the region of said machining gap.

4,408,114

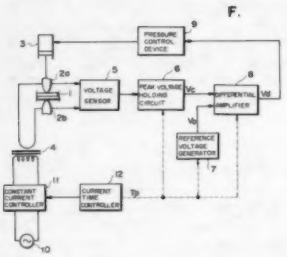
RESISTANCE WELDING WITH PRESSURE CONTROL IN RESPONSE TO DEVIATION BETWEEN WELDING VOLTAGE AND TIME VARYING REFERENCE VALUES THEREFOR

Shuji Nakata, 7-17 Hon-machi 5-chome, Toyonaka-shi, Osaka-fu, Japan; Masahiro Nishikawa, 394-3, Minamihanada-cho, Sakai-shi, Osaka-fu, Japan, and Yoshio Kawaguchi, Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan, by said Yoshio Kawaguchi

Continuation of Ser. No. 177,363, Aug. 11, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 336,955

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—110 **22 Claims**



1. A welding control system comprising:

(a) a constant current controller for holding at a constant value welding current flowing through a pair of welding electrodes between which members to be welded are pinched;

(b) a voltage sensor for detecting a voltage V_c between the pair of welding electrodes while the welding current is flowing:

(c) a reference voltage generator for generating a series of predetermined different reference welding voltages V_o based on a reference voltage vs. welding time curve;

(d) means for comparing the voltage V_c detected by said voltage sensor with the voltage V_o based on the reference voltage curve and deriving a control signal having a magnitude indicative of the deviation between voltages V_c and V_o;

(e) a pressure control device for controlling the welding pressure applied to the two welding electrodes in accordance with the signal magnitude V_d derived from said comparing means; and

(f) a current-time controller for deriving a start-stop signal for controlling starting and stopping of said constant current controller and for deriving a timing signal T_p for synchronizing said reference voltage generator and said comparing means;

whereby the welding voltage between the electrodes is controlled by changing the pressure between the electrodes in accordance with the predetermined reference voltage curve so as to obtain a stable welding quality.

4,408,115

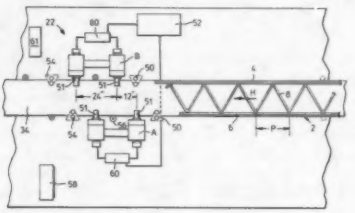
ELECTRICAL RESISTANCE WELDING METHOD AND APPARATUS FOR SAME; AND IMPROVED APPARATUS FOR TESTING WELDS

Joseph M. Tanenbaum, 4 Dewbourne Ave., Toronto, Ontario, Canada M5P 1Z2

Division of Ser. No. 179,634, Aug. 20, 1980. This application Jul. 21, 1981, Ser. No. 285,497

Int. Cl.³ B23K *11/00*

U.S. Cl. 219—119 **7 Claims**



1. In an electrical resistance welding machine for simultaneously welding together opposed chord members to a uniformly undulating web-like structural member or the like along alternate juxtaposed common regions of contact to define a truss or the like wherein the cross-section of one such structural member substantially exceeds the cross-section of the other structural member at each such common region of contact,

(a) a plurality of electrode means adapted simultaneously releasably clamp said members so as to urge and hold same together in truss defining relation and establish at least four alternate juxtaposed conmon regions of contact, each said electrode means including a first electrode of a composition having a relatively high electrical resistance to the transmission of electrical energy for contacting the member of lesser cross-section and a second electrode of a composition having relatively low electrical resistance to the transmission of electrical energy for contacting said member of greater cross-section;

(b) transformer means associated with each said electrode means for simultaneously supplying electrical energy to said members clamped between each said first and said second electrodes, and;

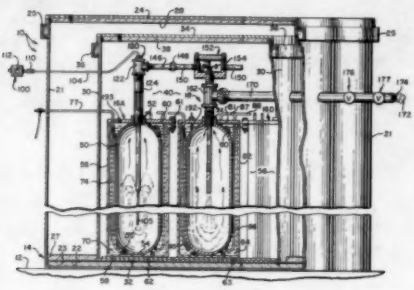
(c) control means associated with said transformer means for simultaneously supplying electrical energy to each said first and second electrodes for selected timed intervals said control means including first timing means for supplying electrical energy at preset selected timed intervals and second timing means for interrupting the supply of electrical energy for a limited period at preset selected timed intervals so as to generate only intermittent impulses and thereby simultaneously incrementally raise the temperature of said members in said aforementioned four regions of contact in stages to the fusion point whereby the escape of heat energy from said region of contact is minimized and the quality of weld maximized.

4,408,116

SUPERHEATED STEAM GENERATOR

Jesse R. Turner, deceased, late of Glenwood, Ark. by Allene A. Turner; executrix, assignor to Superthermal, Inc., New Hope, Ark.

Filed Sep. 22, 1980, Ser. No. 189,091
Int. Cl.³ F22B *1/28, 27/00;* B05B *15/02*
U.S. Cl. 219—273 1 Claim



1. A two stage, superheated steam generator comprising:

a plurality of first stage heaters for producing low temperature steam, each of said first stage heaters comprising:

a rigid, generally cylindrical first stage tank body having a mouth at one end;

a rigid, generally tubular casing coaxially surrounding said first stage tank body;

a meltable heat transfer substance disposed between said casing and said tank body;

at least one electric heating element disposed within said heat transfer substance between said casing and said tank body;

means for injecting a narrow stream of water interiorly of said first stage tank body, said last mentioned means comprising an elongated tube having at least a portion thereof extending longitudinally coaxially through the mouth of said tank body, and terminating in spaced relation to the other end of the tank body;

rigid, coaxially positioned tubular sheath means surrounding and reinforcing that portion of said elongated tube extending within said tank body;

steam output passage means for conducting steam exteriorly of said first stage tank body, said steam output passage being coaxially defined between a steam output pipe coupled to said mouth of said body and said sheath means;

primary water input manifold means for receiving incoming water and distributing water to each of said first stage heaters, said manifold means comprising:

an internal reservoir adapted to receive pressurized water from an external water source;

a pluraltiy of spaced-apart output passageways equal in number to said first stage heaters in fluid flow communication with said internal reservoir, each of said output passageways coupled in fluid flow communication with a separate one of said means for injecting a narrow stream of water interiorly of said first stage tank bodies by a conduit;

constriction means positioned within each of said manifold output passageways for severely restricting the flow of water therethrough,

said constriction means including a tapered nozzle portion directed interiorly of said water manifold means toward said internal reservoir; and,

a plurality of inspection orifices on said manifold means, each of said orifices being substantially aligned with a different one of said constriction means nozzle portions and each being closed by a removable plug for permitting nozzle portion maintenance;

a second stage heater for converting relatively low temperature steam to superheated steam, said second stage heater comprising:

a rigid, generally cylindrical second stage tank body for receiving low temperature steam generated by said first stage heaters;

a rigid, generally tubular casing coaxially surrounding said second stage tank body;

elongated second pipe means extending coaxially through and within said second stage tank body for delivering steam thereto;

a meltable heat transfer substance disposed between said last mentioned casing and said second stage heater tank body;

at least one electric heating element disposed within said last mentioned heat transfer substance for heating said second stage tank body; and,

means for outputting superheated steam from said second stage tank;

said first stage heaters being disposed in encircling relation with respect to said second stage heater at radially spaced-apart intervals about second stage heater circumference;

a centrally disposed steam manifold for receiving steam from each of said first stage steam output passage means and coupled to said second pipe means for delivering steam to said second stage tank body; and,

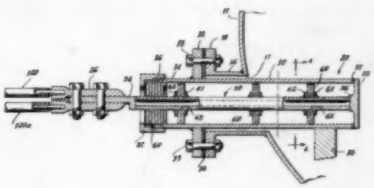
a plurality of radially spaced-apart, spoke-like conduits of equal length extending between said steam output passage means of said first stage heaters and said steam manifold for conducting low temperature steam thereto.

4,408,117

IMPEDANCE HEATING SYSTEM WITH SKIN EFFECT PARTICULARLY FOR RAILROAD TANK CARS

Robert M. Yurkanin, 38 Hobart Gap Rd., Short Hills, N.J. 07078

Filed May 28, 1980, Ser. No. 154,115
Int. Cl.³ F24H *1/20;* H05B *3/82*
U.S. Cl. 219—320 15 Claims



1. The combination of a tank for containing liquid and an impedance heating system for heating liquid in the tank, the combination comprising:

(A) a tank having a tank wall defining an interior space for containing a liquid;

said impedance heating system including at least one heating unit immersed in the liquid within the tank, each heating unit including:

(B) a rigid cylindrical outer pipe conductor, the first end of which is mounted to the tank wall at an opening in the tank wall, said mounting providing a liquid-tight seal between the tank wall and the exterior of the cylindrical outer pipe conductor, said outer pipe conductor extending into said tank and terminating at a second end therein which is spaced-apart from the tank wall, said outer pipe conductor being positioned to be immersed in liquid contained in the tank;

(C) means supporting the rigid outer pipe conductor within the tank;

(D) a conductive end cap secured to and sealing the second end of the outer pipe conductor;

(E) a rigid central conductor positioned within the outer

pipe conductor, one end of the central conductor being secured to the conductive end cap whereby the end cap electrically connects the outer pipe conductor and the central conductor, the central conductor extending substantially the entire length of the outer pipe conductor;

(F) a plurality of temperature resistant electrical insulation discs each having an opening for passing the central conductor therethrough, the insulation discs being deployed at spaced-apart intervals along the central conductor and extending radially outwardly from the central conductor for supporting the central conductor away from the inside surface of the outer pipe conductor;

(G) collar means holding the insulation discs at spaced-apart intervals along the central conductor, said collar means including a plurality of pairs of metal collars, each pair of metal collars being secured to the central conductor and embracing therebetween at least one insulation disc, whereby the insulation discs are held in position on the central conductor as the central conductor with the insulation discs mounted thereon is inserted into the outer pipe conductor;

(H) a source of AC power, the outer pipe conductor and the central conductor being connected thereto in series,

wherein the flow of alternating current causes impedance heating of both the outer pipe conductor and the central conductor as well as heating by reactance and hysteresis and eddy currents, the outer pipe conductor, end cap and central conductor having sufficient thickness that current flow therethrough is concentrated by skin effect on the inside surface of the outer pipe conductor and end cap and the outer surface of the central conductor, whereby the outside surfaces of the outer pipe conductor and end cap within the tank have substantially no voltage or current thereon, and the outer pipe conductor transfers heat generated to the contents of the tank.

4,408,118

CONTROL NETWORK FOR USE IN KNITTING MACHINES AND THE LIKE

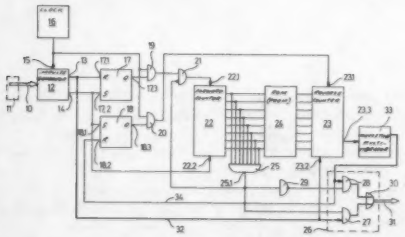
Gerhard Grözinger, Spaichingen; Hartmut Schindler, Albstadt, and Franz Schmid, Bodelshausen, all of Fed. Rep. of Germany, assignors to Sipra Patententwicklungs- und Beteiligungsgesellschaft mbH, both of Stuttgart, Fed. Rep. of Germany

Filed Jul. 7, 1980, Ser. No. 166,253

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928076

Int. Cl.[3] **D04B** *15/68;* **H03K** *5/13, 21/36*

U.S. Cl. 377—2 **8 Claims**



1. A control system for use in electrically operated rotary knitting machines to provide during each cycle of the machine output pulses at a phase relationship to the machine cycle which depends on rotary speed of the machine, comprising a pulse generator coupled to said machine to generate an input train of pulses at a rate corresponding to the rotary speed of the machine; a clock generator for producing clock pulses at a rate which is much greater than the rate of the input pulses and independent therefrom; a forward counter and a reverse counter each having a plurality of counting stages; a programmable memory having a plurality of address terminals connected to respective stages of said forward counter and a plurality of read-out terminals connected to corresponding stages of said reverse counter; a logic switching circuit connected between said pulse generator, said clock generator and said counters to pass to said forward counter during each cycle of the machine a number of clock pulses which is proportional to the rotary speed of the machine and to generate a control signal when all stages of the forward counter have been set; a logic output stage connected between said switching circuit and said reverse counter to output in response to said control signal said input train of pulses while in the absence of the control signal, outputting via said reverse counter output pulses shifted in time relative to the input pulses by an amount which is determined by the program in said memory.

4,408,119

INDIVIDUALIZED PORTABLE OBJECT SUCH AS A CREDIT CARD

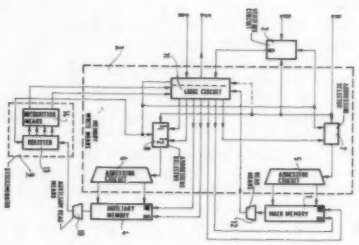
Dominique Decavele, Chevreuse, France, assignor to Transac-Alcatel-Compagnie pour le Development des Transactions Automatiques, Paris, France

Filed Jul. 10, 1981, Ser. No. 282,317

Claims priority, application France, Jul. 11, 1980, 80 15484

Int. Cl.[3] **G06K** *3/00, 5/00*

U.S. Cl. 235—382 **14 Claims**



1. An individualized portable object which requires a user to supply an authorization code in order to use the object, and which includes memory means in which the results of attempts at use are stored permanently and irreversibly in binary form for the purpose of rendering the object invalid after a predetermined number of failed attempts at use, wherein the object further includes memory write means; and discriminator means for distinguishing an un-interrupted sequence of said predetermined number of failed attempts from a sequence of failed attempts including the same number of failed attempts but interrupted by at least one successful attempt for controlling said memory write means as a function of attempts at use prior to a current attempt and for invalidating the object only after an un-interrupted sequence of said predetermined number of failed attempts.

4,408,120

BAR CODE SCANNER

Masahiro Hara; Toshiyasu Sakai, both of Kariya, and Atsutoshi Okamoto, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 26, 1982, Ser. No. 352,564

Claims priority, application Japan, Mar. 16, 1981, 56-38158

Int. Cl.[3] **G06K** *7/10*

U.S. Cl. 235—462 **8 Claims**

1. In a system for scanning bar codes having a plurality of

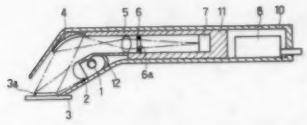
parallel bar symbols recorded in different light reflective colors, a bar code scanner comprising:

a casing;

a light source supported within said casing and illuminating said bar symbols;

an image sensor supported within said casing and being electronically activated one by one to convert reflected light applied from said parallel bar symbols into responsive electric signals, the longitudinal axis of said bar symbols being reflected orthogonally onto the straight read-in line of said image sensor; and

diaphragm member supported within said casing at a portion between said bar symbols and said image sensor and having an aperture, the longitudinal axis of said aperture extending in orthogonal relation with said straight read-in line of said image sensor.



4,408,121

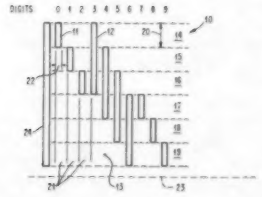
CODE FORMAT FOR BANK CHECK IDENTIFICATION

Matthew J. Galatha, Charlotte, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1982, Ser. No. 347,131

Int. Cl.³ G06K *19/06*

U.S. Cl. 235—494 **10 Claims**



1. A record for machine reading, comprising a record base having on a surface thereof a background region of a first optical characteristic and a plurality of marking elements of a second, contrasting optical characteristic, said marking elements being individually arranged in successive spaces which are disposed side-by-side in a line, and wherein the improvement comprises:

said elements being selected from a plurality of different predetermined lengths in their dimension transverse to said line, and being positioned in different ones of a predetermined set of equal height zones extending parallel to said line, each of said different lengths differing from the length nearest thereto by at least the height of two of said zones,

whereby each element uniquely identifies by its length and location, a character of a predetermined set of characters.

4,408,122

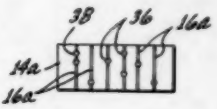
KEY CARD AND METHOD OF MANUFACTURING SAME

Martin S. Casden, Calabasas, Calif., assignor to Soundcraft, Inc., Woodland Hills, Calif.

Continuation-in-part of Ser. No. 119,502, Feb. 7, 1980, abandoned. This application Jan. 14, 1981, Ser. No. 225,144

Int. Cl.³ G06K *7/08*

U.S. Cl. 235—449 **23 Claims**



1. The method of fabricating a passcard comprising:

(a) providing a relatively rigid backing lamination and a carrier sheet secured thereto, said carrier sheet having a plurality of bi-stable magnetic wires disposed thereon in a predetermined pattern, and at least a part of said carrier sheet being of barium ferrite or other similarly magnetizable material and extending over an area adjacent at least some of said wires; and

(b) subjecting said magnetizable material at at least one preselected location in said area adjacent at least one of said wires, to a magnetic force to magnetize the barium ferrite in said preselected location with a different polarity from that of the magnetization of the wires.

4,408,123

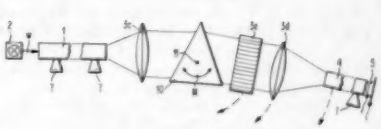
FIBER OPTICAL SENSOR DEVICE FOR MEASURING A PHYSICAL PARAMETER

Georg H. Sichling, Corvallis, Oreg.; Helmut Schwab, and Bernard Schwab, both of Princeton, N.J., assignors to Siemens Corporation, Iselin, N.J.

Filed Feb. 2, 1981, Ser. No. 230,808

Int. Cl.³ G01D *5/30*; G01J *3/34*

U.S. Cl. 250—226 **6 Claims**



1. A fiber optical sensor device for measuring a physical parameter, comprising in combination:

(a) a light source for emitting light;

(b) a first light transmitting fiber having a first light input end receiving light from said light source, and having a first light output end delivering light which is transmitted thereto from said light input end;

(c) means for dispersing the light transmitted by said first light transmitted fiber into its spectral components;

(d) a second light transmitting fiber having a second light input end receiving said spectral components dependent upon said physical parameter, and having a second light output end emitting said spectral components; and

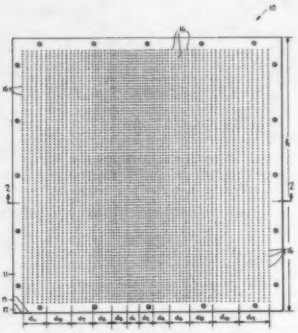
(e) detector means for detecting the spectral components emitted by said second light transmitting fiber;

wherein said means for dispersing the light is a prism, which is arranged between the first light output end of said first light transmitting fiber and the second light input end of said second light transmitting fiber, said prism being rotatable around an axis dependent upon said physical parameter.

4,408,124
BRH TEST PATTERN FOR GAMMA CAMERA PERFORMANCE (AN EVALUATOR)

Peter Paras, Derwood, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 14, 1981, Ser. No. 254,097
Int. Cl.³ G01D *18/00*; G02B *5/00*
U.S. Cl. 250—252.1 **11 Claims**

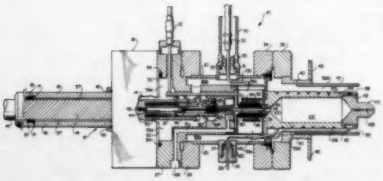


1. A test phantom for testing performance of gamma cameras, said test phantom comprising a plate made of a material impervious to gamma rays and having an array of apertures defined therethrough, said array being arranged in parallel columns of apertures extending in a first direction and parallel rows of apertures extending in a second direction, said columns being arranged in plural groups wherein the spacing between adjacent columns in each group is different from the spacing between adjacent columns in all other groups but wherein the adjacent column spacing within each group is uniform throughout that group.

4,408,125
MODULAR PYROLYSIS INLET AND METHOD FOR PYROLYZING COMPOUNDS FOR ANALYSIS BY MASS SPECTROMETER

Hendrik L. C. Meuzelaar, Summit Park, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Jul. 13, 1981, Ser. No. 282,789
Int. Cl.³ H01J *49/04*
U.S. Cl. 250—288 **39 Claims**

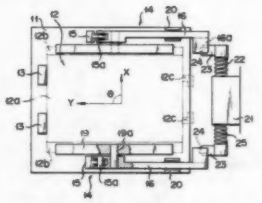


1. An apparatus for pyrolyzing a sample prior to analysis by a mass spectrometer, comprising:
an insertion probe for bearing the sample;
a reaction chamber which is mounted to the insertion probe so as to encompass the sample;
means for preheating at least a portion of the reaction chamber;
means for rapidly heating the sample within the preheated portion of the reactant chamber sufficient to pyrolyze the sample, said means for rapidly heating the sample being independent of the preheating means; and
an outlet formed in the reaction chamber to allow passage of the pyrolyzed sample into a mass spectrometer positioned adjacent the reaction chamber, said outlet being positioned so as to direct the pyrolyzed sample into the mass spectrometer while substantially prohibiting passage of the pyrolyzed sample into regions of the pyrolyzing apparatus outside of the reaction chamber.

4,408,126
CASSETTE RETAINING DEVICE OF ELECTRON BEAM APPARATUS

Toru Tojo, Yamato; Kazuyoshi Sugihara, Yokohama; Shuntaro Hata, Yokosuka; Hirooki Numaga, Numazu; Haruhisa Mukooyama, Fuji, and Yoshio Suzuki, Numazu, all of Japan, assignors to Toshiba Machine Co., Ltd., Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Filed Apr. 2, 1981, Ser. No. 250,386
Claims priority, application Japan, Apr. 7, 1980, 55/45479
Int. Cl.³ G21K *5/10*
U.S. Cl. 250—442.1 **9 Claims**

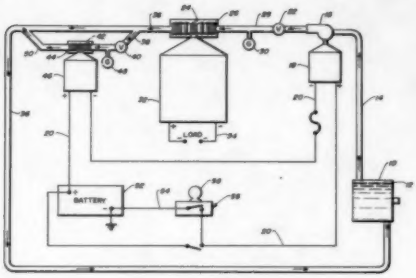


1. A cassette retaining device comprising:
a sample table;
a stop means disposed on the top surface of said sample table and engaging the front end face of a cassette transferred along said top surface, whereby said cassette is stopped at a predetermined position in surface contact with said top surface; and
a pair of retaining mechanisms disposed respectively on both sides of the top surface of said sample table and mounted for pressing respectively on both sides of the top surface of the cassette to hold said cassette in said predetermined position between said retaining mechanisms and said sample table,
each said retaining mechanism including:
a presser capable of moving in a direction having a component perpendicular to said top surface of said cassette, between a first position where said presser presses in said direction on a side portion of the top surface of the cassette to hold said cassette in surface contact with said top surface, and a second position where said presser is separated from the top surface of said sample table to allow said cassette to be inserted or removed from between said presser and said sample table;
a rocking arm rockable around a first horizontal axis relatively to said sample table and bearing said presser so that said presser may rock around a second horizontal axis parallel to said first horizontal axis; and
an urging means urging said rocking arm to rock in one direction, thereby locating said presser in said first position.

4,408,127
POWER GENERATING APPARATUS

Astrogildo Santos, Sr., 20301 Cantara St., Canoga Park, Calif. 91304

Filed May 13, 1982, Ser. No. 377,950
Int. Cl.³ F03B 13/00
U.S. Cl. 290—54 4 Claims

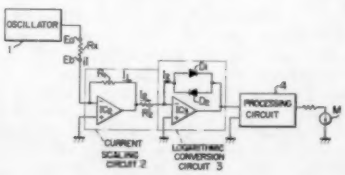


1. A power generating apparatus comprising:
a closed fluid conducting conduit assembly;
a fluid reservoir connected to said conduit assembly, a fluid contained within said reservoir;
a pump connected to said conduit assembly, said pump to move said fluid through said conduit assembly, said pump being driven solely from energy from a first energy source;
a primary turbine rotatably driven by the movement of said fluid from said pump, said primary turbine producing primary output energy, a load receiving said primary output energy;
a secondary turbine connected in said conduit assembly, said secondary turbine being rotatably driven by the movement of the fluid from said primary turbine, said secondary turbine producing secondary output energy, said secondary turbine being located downstream of said primary turbine, said secondary output energy comprising in part said first energy source;
a battery, said battery being connected to and comprising in part said first energy source; and
switching means manually connected to said first energy source for activating said pump.

4,408,128
ELECTRIC RESISTANCE TYPE WIDE RANGE MOISTURE METER

Toshio Fujita, Tokyo, Japan, assignor to Kett Electric Laboratory, Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 298,542
Claims priority, application Japan, Mar. 8, 1979, 54-27206; Sep. 10, 1980, 55-125849
Int. Cl.³ G01R 27/02, 15/10
U.S. Cl. 324—65 R 8 Claims

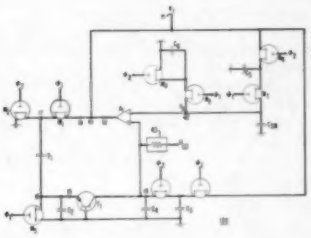


1. In an electric resistance type moisture measurement apparatus comprising a means for measuring the electric resistance of a sample to be measured, a current-voltage logarithmic conversion means coupled to said resistance measuring means for converting a current flowing through the sample when a constant voltage is applied thereto to a voltage signal as a moisture content corresponding to the measured electric resistance and converting an expoential characteristic of the moisture content signal to an essentially linear characteristic, and an indicator means for indicating the converted signal outputted from said conversion means in terms of the moisture content,
a wide range moisture content measuring device comprising an operational amplifier having a current feedback path, connected between said resistance measuring means and said current-voltage logarithmic conversion means, said operational amplifier including a load resistor and a feedback resistor, whereby a current flowing through said sample is scaled into said resistors and the scaled current flowing through said load resistor is supplied to said current-voltage logarithmic conversion means.

4,408,129
CONSTANT ENERGY DRIVE CIRCUIT FOR ELECTROMAGNETIC PRINT HAMMERS

Robert W. Arnold, Glen Aubrey, and Dean W. Skinner, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1981, Ser. No. 274,848
Int. Cl.³ H03K 3/01, 3/26, 17/26, 5/22
U.S. Cl. 307—270 13 Claims



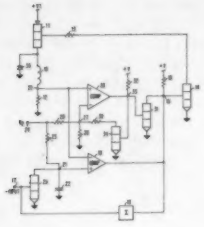
1. In combination with a coil of an electromagnetic actuator for a print hammer or the like, a drive circuit for supplying a fixed amount of energy to said coil comprising
switch means operable in a cyclical manner for connecting said coil alternately to a supply voltage source to energize said coil and to a grounding circuit to deenergize said coil,
means for enabling said switch means for connecting said coil to said supply voltage source for an operating interval of fixed duration,
said operating interval having a fixed rise time portion followed by a remaining portion,
first circuit means operable in response to rising current in said coil for cycling said switch means at a first switching frequency as determined by a rising reference signal during said fixed rise time portion of said operating interval, and
second circuit means responsive to first and second peak current levels in said coil as determined by alternating first and second peak reference signals for cycling said switch means at a second switching frequency so as to maintain a desired average current in said coil during said remaining portion of said operating interval.

4,408,130

TEMPERATURE STABILIZED VOLTAGE REFERENCE

Harry J. Boll, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 5, 1981, Ser. No. 308,657
Int. Cl.³ H03K *5/22, 3/01*
U.S. Cl. 307—296 R **9 Claims**



1. A network (**10** or **100**) comprising
(a) a bipolar transistor (T_1);
(b) first clocked voltage source means (C_1, C_2, M_1, M_2, M_5) having an input terminal (**18**) and an output terminal (**15**);
(c) means for connecting the output terminal (**15**) of the first clocked means (C_1, C_2) to an emitter terminal of said transistor (T_1);
(d) second clocked voltage source means (C_3, C_4, M_3, M_4) having an output terminal (**14**);
(e) means for connecting the output terminal (**14**) of said second clocked means (C_3, C_4, M_3, M_4) to a collector terminal of said transistor (T_1);
(f) a difference amplifier (A_1) having first (+) and second (−) input terminals of opposite polarity;
(g) means for connecting said collector terminal of said transistor (T_1) to the first input terminal (+) of said difference amplifier (A_1); and
(h) means for connecting an output terminal (**12**) of said difference amplifier (A_1) to the input terminal (**18**) of said first clocked means (C_1, C_2, M_1, M_2, M_5), the output terminal (**12**) of said difference amplifier (A_1) being connected to an output terminal (**11**) of said network (**10** or **100**).

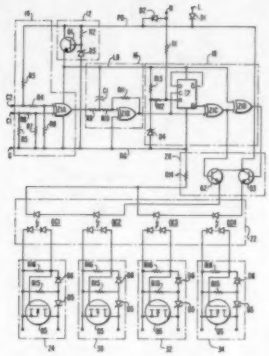
4,408,131

OPTICALLY ISOLATED SOLID STATE RELAY

David A. Fox, Shawnee Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1981, Ser. No. 303,811
Int. Cl.³ H03K *3/42, 19/42*
U.S. Cl. 307—311 **8 Claims**

1. A solid state relay comprising:
sensing means for responding to an input voltage signal by producing a logic signal of a relatively fixed magnitude;
a logic gate having a first input terminal operatively connected to receive said logic signal from said sensing means, an output terminal, and a second input terminal;
said second input terminal having a fixed interconnection to means for generating a first signal changing in logic state only upon a predetermined change in the waveform of said logic signal from said sensing means;
means for selectively overriding said first signal connected to said second input terminal;
a light emitting diode responsive to said logic first signal appearing at said output terminal for generating radiation;
an array of photodiodes connected in series between a pair of array electrodes and operatively coupled to said light emitting diode for developing a control voltage across said array electrodes in response to radiation from said light emitting diode;
a field effect transistor including a pair of current carrying electrodes, a gate electrode and a substrate electrode, one of said array electrodes connected to said gate electrode and the other of said array electrodes connected to said substrate electrode whereby the impedance between said current carrying electrodes has one value in the absence of and a greatly different value in the presence of said control voltage between said gate electrode and said substrate electrode;



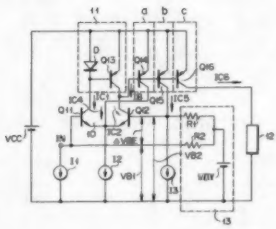
means for providing a large resistive impedance between said gate electrode and said substrate electrode;
and
a pair of output terminals, each connected to a respective one of said current carrying electrodes.

4,408,132

HYSTERESIS CIRCUIT

Hisao Kuwahara, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1981, Ser. No. 299,227
Claims priority, application Japan, Sep. 10, 1980, 55-125755
Int. Cl.³ H03K *3/295, 5/153*
U.S. Cl. 307—359 **4 Claims**



1. A hysteresis circuit comprising first and second transistors constituting a differential amplifier, a first constant current source connected between the common emitter of said first and second transistors and a reference potential point, an input signal source connected to the base of said first transistor, a second constant current source connected between the base of said second transistor and said reference potential point, a bias voltage source connected through a first resistor to the base of said second transistor, and third, fourth and fifth transistors of the opposite conductivity type to said first and second transistors and each having the emitter connected to one end of a power supply and the base connected to the collector of said second transistor, said third transistor having the collector connected to the emitter of said second transistor, said fourth transistor having the collector connected to the base of said

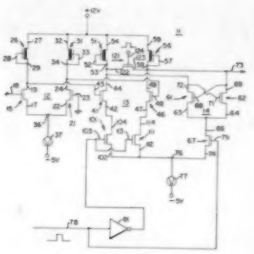
second transistor, said fifth transistor having the collector connected to a load circuit.

4,408,133

COMPARATOR CIRCUIT WITH IMPROVED RELIABILITY AND/OR SPEED

Michael Cooperman, and William L. Geller, both of Framingham, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 30, 1981, Ser. No. 249,036
Int. Cl.³ H03K *5/153*
U.S. Cl. 307—362 **10 Claims**



1. An improved comparator circuit utilizing a plurality of triodes, each having a pair of primary electrodes and one control electrode, including

a first differential amplifier having one primary electrode of a first triode and one primary electrode of a second triode coupled together for coupling to a negative potential source via a first conductive medium, one control electrode of said first triode for receiving an analog input signal, one control electrode of said second triode being coupled to a point of reference potential, a third triode connected as a resistive load for coupling a positive potential source to a second primary electrode of said first triode, and a fourth triode connected as a resistive load for coupling said positive potential source to a second primary electrode of said second triode;

a second differential amplifier having one primary electrode of a fifth triode and one primary electrode of a sixth triode coupled via suitable means for coupling to said negative potential source via a second conductive medium, one control electrode of said fifth triode being coupled to said second primary electrode of said first triode, one control electrode of said sixth triode being coupled to said second primary electrode of said second triode, a seventh triode connected as a resistive load for coupling said positive potential source to a second primary electrode of said fifth triode, and an eighth triode connected as a resistive load for coupling said positive potential source to a second primary electrode of said sixth triode;

a latch having one primary electrode of a ninth triode and one primary electrode of a tenth triode coupled together to one primary electrode of an eleventh triode, a second primary electrode of said eleventh triode for coupling to said negative potential source via said second conductive medium, one control electrode of said ninth triode coupled to a second primary electrode of said tenth triode, one control electrode of said tenth triode coupled to a second primary electrode of said ninth triode, said second primary electrode of said ninth triode coupled to said second primary electrode of said fifth triode, said second primary electrode of said tenth triode coupled to said second primary electrode of said sixth triode, and said second primary electrode of said tenth triode, providing a digital output therefrom; and

a switching circuit including means for receiving a storage pulse for coupling to one control electrode of said eleventh triode, and means for coupling an inverted form of said storage pulse to said suitable means,

the improvement wherein said suitable means comprises

a twelfth triode having one control electrode coupled to receive said inverted form of said storage pulse, a first primary electrode coupled to said negative potential source via said second conductive medium, and a second primary electrode coupled to said one primary electrode of said fifth triode; and

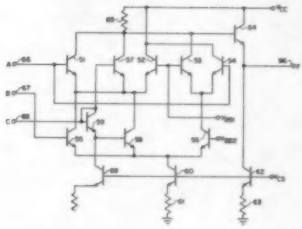
a thirteenth triode having one control electrode coupled to receive said inverted form of said storage pulse, a first primary electrode coupled to said negative potential source via said second conductive medium, and a second primary electrode coupled to said one primary electrode of said sixth triode.

4,408,134

UNITARY EXCLUSIVE OR-AND LOGIC CIRCUIT

Michael Allen, San Francisco, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 19, 1981, Ser. No. 226,323
Int. Cl.³ H03K *19/086, 19/20, 19/21*
U.S. Cl. 307—471 **19 Claims**



1. A circuit comprising

first and second transistors having emitters coupled together, collectors of said first and second transistors connected to a first voltage source with a first impedance means between the collector of said first transistor and said first voltage source, a base of said first transistor connected to a first input terminal, a base of said second transistor connected to a first reference voltage source,

third and fourth transistors having emitters coupled together, a collector of said third transistor connected to the collector of said first transistor, a collector of said fourth transistor connected to the collector of said second transistor, a base of said third transistor connected to said first reference voltage source, a base of said fourth transistor connected to said first input terminal,

fifth and sixth transistors having emitters coupled together, a collector of said fifth transistor connected to the coupled emitters of said first and second transistors, a collector of said sixth transistor connected to the coupled emitters of said third and fourth transistors, a base of said fifth transistor connected to a second input terminal, a base of said sixth transistor connected to a second reference voltage source,

a first current source connected to the coupled emitters of said fifth and sixth transistors,

a seventh transistor having an emitter connected to the coupled emitters of said first and second transistors, a collector connected to the collector of said first transistor, a base connected to a third input terminal,

an eighth transistor having an emitter connected to the coupled emitters of said fifth and sixth transistors, a collector connected to the coupled emitters of said first and second transistors, a base connected to said third input terminal through a voltage displacement means, and

a second current source connected to the base of said eighth transistor,

whereby functionally said first and second input terminals form the input terminals of an EXCLUSIVE OR logic gate, the output terminal of said EXCLUSIVE OR logic gate forms a first input terminal to an AND logic gate, and said third input terminal forms a second input of said AND logic gate.

4,408,135

MULTI-LEVEL SIGNAL GENERATING CIRCUIT

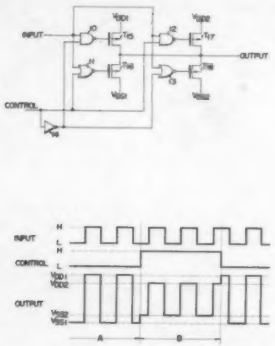
Toshio Yuyama, Kawasaki; Ryuzo Shiraki, and Seizi Watanabe, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 16, 1980, Ser. No. 216,818

Claims priority, application Japan, Dec. 26, 1979, 54-169755; Dec. 26, 1979, 54-169756

Int. Cl.³ H03K *19/094, 17/687*

U.S. Cl. 307—474 **2 Claims**



1. A multi-level signal generating circuit for changing, in response to a control pulse signal, the high and low levels of an input signal between voltage levels supplied by a first voltage source and voltage levels supplied by a second voltage source, said circuit comprising:

an input terminal coupled to said input signal;

a first voltage source terminal connected to a high voltage level of said first voltage source;

a second voltage source terminal connected to a low voltage level of said first voltage source;

a third voltage source terminal connected to a high voltage level of said second voltage source;

a fourth voltage source terminal connected to a low voltage level of said second voltage source;

a control terminal coupled to said control pulse signal;

a first CMOS circuit coupled to said input terminal, said control terminal and said first and second voltage source terminals, said first CMOS circuit producing, when enabled by said control pulse signal, a first output signal varying in response to said input signal between approximately said high and low voltage levels of said first voltage source, said first CMOS circuit comprising first and second MOS transistors complementary to each other and connected in series between said first and second voltage source terminals and first logic means connected between said input and control terminals and the gates of said first and second MOS transistors for supplying said input signal to said gates of said first and second transistors when said control pulse signal is in a first state thereby to enable said first CMOS circuit; and

a second CMOS circuit coupled to said input terminal, said control terminal, and said third and fourth voltage source terminals, said second CMOS circuit producing, when enabled, a second output signal varying in response to said input signal between approximately said high and low voltage levels of said second voltage source, said second CMOS circuit comprising third and fourth MOS transistors complementary to each other and connected in series between said third and fourth voltage source terminals and second logic means connected between said input and control terminals and the gates of said third and fourth MOS transistors for supplying said input signal to the gates of said third and fourth transistors when said control pulse signal is in a second state thereby to enable said second CMOS circuit.

4,408,136

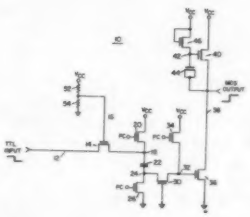
MOS BOOTSTRAPPED BUFFER FOR VOLTAGE LEVEL CONVERSION WITH FAST OUTPUT RISE TIME

Howard C. Kirsch, Colorado Springs, Colo., assignor to Mostek Corporation, Carrollton, Tex.

Filed Dec. 7, 1981, Ser. No. 328,375

Int. Cl.³ H03K *19/017, 19/096*

U.S. Cl. 307—475 **10 Claims**



1. A buffer circuit, comprising:

a capacitor;

means for precharging said capacitor to a first state;

input transistor means connected to receive an input signal for driving said capacitor from said first state to a second state when said input signal transistions from a first voltage level to a second voltage level;

a control node;

means for precharging said control node;

means connected to said capacitor and said control node for discharging said control node when said capacitor is driven from said first state to said second state; and

output transistor means connected to said control node for driving an output node to a third voltage level when said control node is precharged and for driving said output node to a fourth voltage level when said control node is discharged.

4,408,137

BREAK-BEFORE-MAKE SOLID STATE RELAY

David A. Fox, Shawnee Township, Lima County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1981, Ser. No. 331,408

Int. Cl.³ H03K *3/295, 19/21, 3/42*

U.S. Cl. 307—598 **10 Claims**

1. A solid state relay comprising:

sensing means for responding to an input voltage signal by producing a logic signal of a relatively fixed magnitude;

a logic gate having a first input terminal operatively connected to receive said logic signal from said sensing means, an output, and having a second input terminal;

said second input terminal having a fixed interconnection to means for generating a first signal changing in logic state only upon a predetermined change in the waveform of said logic signal from said sensing means;

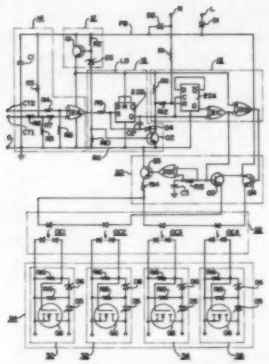
means for selectively overriding said first signal connected to said second input terminal with an externally available function terminal;

said function terminal requiring no connection for an output signal from said logic gate to provide latching type operation of the relay;

at least two light emitting diodes responsive to said logic signal, appearing at said output, for generating radiation;

at least two arrays of photodiodes each connected in series between a pair of array electrodes and operatively coupled to said light emitting diodes for developing a control voltage across said array electrodes in response to radiation from said light emitting diode;

at least two field effect transistors each including a pair of current carrying electrodes, a gate electrode and a substrate electrode, one of said array electrodes connected to said gate electrode and the other of said array electrodes connected to said substrate electrode whereby the impedance between said current carrying electrodes has one value in the absence of and a greatly different value in the presence of said control voltage between said gate electrode and said substrate electrode;



means for providing a large resistive impedance between said gate electrode and said substrate electrode of each of said field effect transistors;

a pluraltiy of output terminals, each connected to a respective one of said current carrying electrodes; and

means for momentarily turning off said light emitting diodes in response to a change in said logic signal, appearing at said output said light emitting diodes remaining in the off condition for a time period longer than the worst case difference between the turn off time and the turn on time of said field effect transistors.

4,408,138

LINEAR STEPPER MOTOR

Takachiyo Okamoto, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 20, 1981, Ser. No. 245,958

Claims priority, application Japan, Apr. 15, 1980, 55-50181

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—12 **6 Claims**

1. In a linear stepper motor including

a stator bar having teeth portion along a longitudinal axis thereof, and a pair of rail portions which are provided on both sides of said teeth portion;

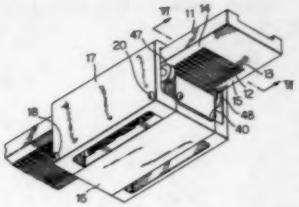
said teeth portion having a plurality of stator teeth transverse to said longitudinal axis, with a pitch proportional to a minimum distance of the motion of said motor; and

a slider movably mounted on said stator bar;

said slider including a plurality of rollers engagable with said rail portions, an armature formed with poles having surfaces cooperative with said teeth portion of said stator bar, and windings on said poles;

said pole surfaces having teeth with a pitch correlated to the pitch of said stator teeth and being opposite to said teeth portion of said stator bar with a predetermined small gap therebetween when said rollers engage with said rail portions;

the improvement wherein said teeth portion and said rail portions are formed on one surface of said stator bar, said stator bar being made of soft steel having high permeability magnetic properties, said rail portions being covered with metallic material which is substantially harder than said soft steel, and wherein said metallic material is chemically plated with a nickel compound thereby to form a nickel coating on said rail portions.



4,408,139

ASYNCHRONOUS LINEAR ELECTRIC MOTOR

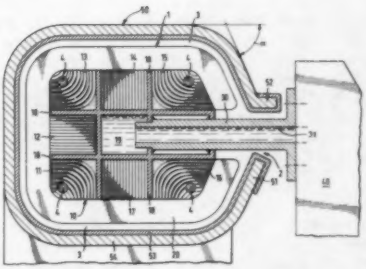
Peter Schwärzler, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Krauss-Maffei AG, Munich, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,575

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 3029618

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—13 **6 Claims**



1. An asynchronous linear motor comprising:

a reaction rail of generally U-shaped cross section having an inner conductive layer and opening at one side of said rail while extending along a path; and

a stator receivable in said rail and defining an air gap therewith whereby a traveling magnetic field across said gap displaces said stator relative to said rail along said path, said stator comprising:

a stator core elongated in the direction of said path,

a comb-like array of outer sheet stacks surrounding said core and spaced apart therealong while lying in planes perpendicular to said path, and

respective coils surrounding said core and disposed between the outer sheet stacks of said array, said core comprising:

a multipocketed grid-shaped frame of non-magnetic material connectable to a load and supporting said

stator, said frame having pockets confronting the shanks and web of said rail, and

respective inner core sheet stacks received in said pockets.

4,408,140

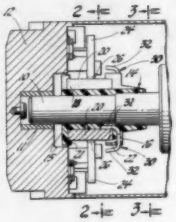
COMMUTATOR ASSEMBLY WITH HOOK MEMBERS

Ricky D. Thompson, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1981, Ser. No. 326,802

Int. Cl.³ H01R *39/16*

U.S. Cl. 310—234 **2 Claims**



1. A commutator assembly for a dynamoelectric machine having metallic brushes, said assembly comprising:

a generally cylindrical core comprising a hard molded plastic insulating material;

a plurality of commutator bars comprising a composite carbon material, said bars being affixed to said core in axial alignment and predetermined circumferential spacing for radial brush contact during operation of the machine; and

a plurality of commutator hook members, one being associated with each of said bars, each said hook member comprising an electrically conducting metal, and further comprising a substantially U-shaped portion clamping one axial end of its associated bar and a hook portion projecting away from said associated bar for electrical wire connection thereto, at least part of said hook member being trapped in said core, whereby its associated bar is prevented from migrating from its predetermined spacing and axial alignment in response to brush forces during operation of the machine.

4,408,141

DUAL CATHODE BEAM MODE FLUORESCENT LAMP

Wojciech W. Byszewski, Arlington; A. Bowman Budinger, Westford, and Joseph M. Proud, Wellesley Hills, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 4, 1982, Ser. No. 337,046

Int. Cl.³ H01J *23/16, 29/96, 7/44, 13/46, 17/34, 19/78*

U.S. Cl. 315—56 **11 Claims**

1. A dual cathode beam mode fluorescent lamp comprising:

a light transmitting envelope enclosing a fill material which emits ultraviolet radiation upon excitation;

an AC power source external to said envelope;

a phosphor coating, which emits visible light upon absorption of ultraviolet radiation, on an inner surface of said envelope;

a start circuit;

a first and a second thermionic electrode, each of said electrodes located within said envelope and each having first and second ends;

first means for connecting said first ends of each of said first and second electrodes to said power source;

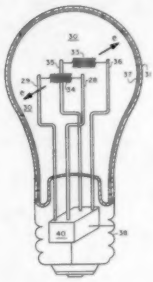
second means for connecting said second ends of each of said first and second electrodes to said start circuit;

said first and second electrodes oriented lengthwise and parallel to each other;

said first and second electrodes operated in response to a first polarity of said AC power source so that, said first electrode operates as a thermionic cathode for emitting electrons and said second electrode operates as an anode for accelerating said electrons and forming a first electron beam;

said first and second electrodes alternately operated in response to a second polarity of said AC power source so that, said second electrode operates as a thermionic cathode for emitting electrons and said first electrode operates as an anode for accelerating said electrons and forming a second electron beam in a direction generally opposite to that of said first electron beam;

said first and second electrodes further operated so that during said first polarity of said AC power source, said second electrode is heated for subsequent operation as a



cathode by said collected electrons of said first electron beam and alternately during said second polarity of said AC power source, said first electrode is heated for subsequent operation as a cathode by said collected electrons of said second electron beam;

first and second drift regions, each located within said envelope through which said first and said second electron beams drift after passing said first and said second anodes respectively, each of said drift regions having a dimension in the direction of travel of said respective electron beam which is greater than the electron range in said fill material, whereby the electrons in each of said drift regions collide with the atoms of said fill material, thereby causing excitation of first and second respective portions of said fill material atoms and emission of ultraviolet radiation and causing ionization of other portions of said fill material atoms thereby yielding secondary electrons, said secondary electrons causing emission of additional ultraviolet radiation.

4,408,142

DEVICE FOR THE CONTROL OF THE LUMINOUS FLUX FROM A MAIN BEAM BULB IN A MOTOR VEHICLE

Sven O. E. Wilje, Sagvägen 1, 791 00 Falun, Sweden

Filed May 20, 1981, Ser. No. 265,401

Int. Cl.³ B60Q *1/02*

U.S. Cl. 315—82 **8 Claims**

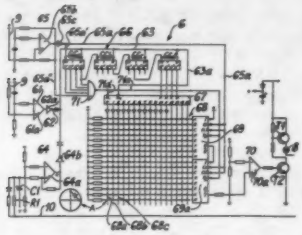
1. A circuit providing a gradual decrease in the luminous flux emitted by a main beam headlamp in a motor vehicle upon the generation of a switching signal indicating a changeover from main beam to dimmed beam, comprising:

an oscillator for generating output pulses;

a counter for counting said output pulses upon the occurrence of said switching signal;

means responsive to said counter for producing a headlamp control signal that varies over time to represent a gradual

decrease in luminous flux according to a predetermined pattern; and



an exciter responsive to said headlamp control signal for reducing the current in the main beam headlamp in accordance with said pattern.

4,408,143

COLOR IMAGE DISPLAY APPARATUS

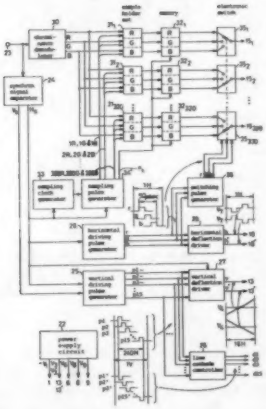
Shizuo Inohara, Toyonaka; Mitsuya Masuda, Kyoto; Sadahiro Iyehara, Suita; Minoru Ueda, Takatsuki, and Keisuke Yamamoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 10, 1982, Ser. No. 387,144

Claims priority, application Japan, Jun. 18, 1981, 56-94994

Int. Cl.³ H01J *29/70, 29/72*

U.S. Cl. 315—366 **3 Claims**



1. An image display apparaus comprising:

a phosphor screen having a phosphor layer for emitting light at impingement by electron beam, said phosphor screen having a predetermined number of segments formed by dividing in vertical direction, and also having another predetermined number of subsegment formed by dividing in horizontal direction, each subsegment having three primary color phosphor regions disposed in horizontal direction,

an electron beam source for in-turn emitting a predetermined number of horizontal rows of electron beams, for producing one horizontal line of image on said phosphor screen,

a vertical deflection means for vertical deflections of said electron beams of said horizontal rows in a manner that electron beams of a horizontal row impinging said phosphor screen at one of said vertically divided segment corresponding to one of said horizontal row is simultaneously driven vertically, thereby vertically moving one of said horizontal line in said vertically divided segment,

a horizontal deflection means for horizontal deflections of said electron beams of said horizontal rows thereby sequentially to impinge selected color phosphors to display a selected color images sequentially in said segment,

a control means for controlling intensities of said electron beams responding to control electric signals applied thereto, and

a flat shaped vacuum enclosure containing the above-mentioned components therein, one end face thereof forming a screen face in which the color phosphor screen is provided,

characterized by further comprising

a control signal producing means for producing said control signals by decoding color picture signals thereby producing primary color signals, and sampling said primary color signal by a set of three sampling pulses for three primary colors of light, which three sampling pulses are issued in a time sequence in the color order corresponding to that of displaying, and within a time period corresponding to electron beam scanning for one horizontal picture element, and sampled chrominance signals are applied in said time sequence to said control means.

4,408,144

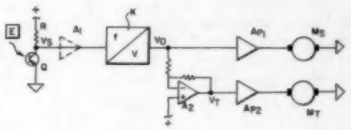
TAPE TENSION CONTROL FOR A TAPE TRANSDUCER

Henry J. Lukes, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 28, 1982, Ser. No. 343,562

Int. Cl.³ B65H *59/38*

U.S. Cl. 318—7 **6 Claims**



1. A torque control circuit for controlling the currents of both take-up and supply reel motors of a three-motor tape recorder/reproducer, in which

the take-up reel motor is equipped with a motion encoder which delivers an AC signal with frequency proportional to the motor speed,

in which this signal, after amplification, is fed to the input of a frequency-to-voltage converter whose output voltage drives, via a first power amplifier, the supply reel motor,

said signal being inverted and amplified in an additional inverting amplifier whose output voltage drives, via a second power amplifier, the take-up reel motor.

4,408,145

LINEAR ELECTRIC MOTOR

Vladimir I. Artemenko; Viktor T. Belikov; Anatoly D. Ivlev, and Viktor A. Manzelev, all of Odessa, U.S.S.R., assignors to Odessky Politekhnichesky Institut, Odessa, U.S.S.R.

PCT No. PCT/SU80/00167, § 371 Date May 20, 1982, § 102(e) Date May 20, 1982, PCT Pub. No. WO82/01284, PCT Pub. Date Apr. 15, 1982

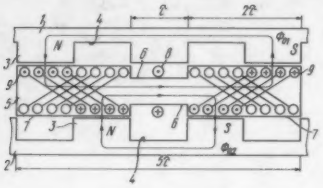
PCT Filed Sep. 29, 1980, Ser. No. 385,373

Int. Cl.³ H02K *41/00*

U.S. Cl. 318—135 **1 Claim**

1. A linear electric motor comprising a stator whose magnetic core is formed by two equidistant strips made of a ferromagnetic material and provided with uniformly alternating projections and recesses, the projections of one strip, being turned to the projections of the other strip a movable core having regions with high and low magnetic permeability and

disposed between said strips, an armature winding provided with two coil groups having equal number of sections in each group, the electrical connection between said groups being accomplished by means of a commutation device, and an excitation system, characterized in that the projections /3/ and the recesses /4/ of each of the strips /1/, /2/ of the magnetic core of the stator have a length equal to the pole pitch of the motor and are so dispoed that the projections /3/ of one strip /1/ are shfted along the movable core /5/ relative to the projections /3/ of the other strip by the magnitude of the pole pitch of the motor, the movable core /5/ has a middle portion /6/ whose length is equal to the pole pitch of the motor and two extreme



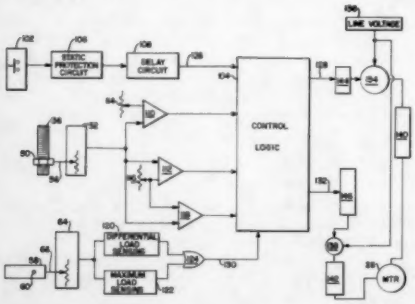
portions whose length is a multiple of two pole pitches of the motor, the excitation system is an excitation winding /8/ laid on the middle portion /6/ of the movable core, the armature winding /9/ is laid within grooves on the extreme portions of said core in symmetrical relationship with respect to the excitation winding /8/ and is connected to the commutation device /10/ so that the ends of the sections of the first coil group and the beginnings of the sections of the second coil group are connected to the commutation device /10/ via semiconductor devices having elements connected with the opposite polarity, and the last section of the first coil group and the first section of the second coil group are electrically connected in the commutation device /10/.

4,408,146

AUTOMATIC DOOR OPERATOR

Howard L. Beckerman, Middletown, N.J., assignor to Automatic Doorman, Inc., Paterson, N.J.

Filed Jan. 30, 1981, Ser. No. 229,793
Int. Cl.³ H02P 1/22
U.S. Cl. 318—264 **19 Claims**



1. An operator for moving a door between first and second positions including a selectively energizable reversible electric motor, drive means for coupling said motor to said door, means for providing a contact closure signal, and control means responsive to the occurrence of a contact closure signal when said door is in one of said first and second positions for energizing said motor to move said door toward the other of said first and second positions, wherein the improvement comprises:

means coupled to said drive means for generating a force signal having a magnitude directly corresponding to the instantaneous magnitude of the force opposing movement of said door;

differentiation means for measuring the magnitude of the instantaneous rate of change of said force signal with respect to time and providing an obstruction signal related thereto; and

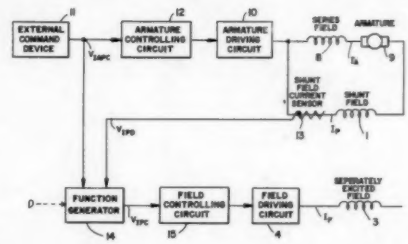
safety means responsive to said obstruction signal exceeding a predetermined threshold value for causing said control means to deenergize said motor.

4,408,147

METHOD AND APPARATUS FOR HIGH EFFICIENCY OPERATION OF ELECTROMECHANICAL ENERGY CONVERSION DEVICES

Jonathan Gabel, 5800 Ocean View Dr., Oakland, Calif. 94618

Continuation-in-part of Ser. No. 143,044, Mar. 19, 1981. This application Mar. 16, 1982, Ser. No. 358,697
Int. Cl.³ H02P 5/16
U.S. Cl. 318—493 **21 Claims**



1. A method for minimizing, by use of a predetermined optimizing function, the loss of power in a separately excited electromechanical energy conversion device and in a controller of said energy conversion device, said energy conversion device having n spatially fixed windings, $n \geqq 1$, for producing a first magnetic field, and having m movable windings, $m \geqq 1$, for producing a second magnetic field which opposes said first magnetic field produced by said n spatially fixed windings, such that said first magnetic field produced by said n spatially fixed windings can be varied, at least in part, independently of said second magnetic field produced by said m movable windings, said method comprising:

the step of first generating a command signal having a magnitude A;

the step of generating currents $I_1(A), I_2(A), \ldots, I_n(A)$ in said n spatially fixed windings, respectively;

and the step of generating currents $I_{n+1}(A), I_{n+2}(A), \ldots, I_{n+m}(A)$ in said m movable windings, respectively;

wherein said currents $I_1(A), I_2(A), \ldots, I_n(A), I_{n+1}(A), I_{n+2}(A), \ldots, I_{n+m}(A)$ are selected in such a manner that their magnitudes as a function of said command signal having a magnitude A satisfy said predetermined optimizing function;

and wherein said predetermined optimizing function takes into account the incremental changes in said first and second magnetic fields caused by each of said n+m currents in each of said n+m windings.

4,408,148

CONTROLLER FOR A LOCKABLE SERVO MOTOR

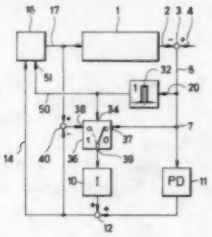
Rudolf Herzog, Tobel, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 16, 1981, Ser. No. 321,613

Claims priority, application Switzerland, Dec. 5, 1980, 9006/80

Int. Cl.³ G05B *11/42*

U.S. Cl. 318—610 **4 Claims**



1. A controller for a blockable servomotor comprising

comparing means for comparing an actual value and a set value to generate a difference signal in response to a difference therebetween;

a proportional network connected to said means to receive said difference signal and to generate a proportional action signal in response thereto;

an integral network connected to said means in parallel with said proportional network to receive said difference signal and to generate an integral action signal in response thereto;

a summating member connected to said networks to receive and add said proportional action signal and said integral action signal to generate an input signal for the servomotor;

a subtraction member connected to said summating member to receive said input signal for subtraction from an output signal of the servomotor to generate a deviation signal;

a selector having one input connected to said means to receive said difference signal, a second input connected to said subtraction member to receive said deviation signal, and an output connected to said first input and said integral network to deliver said difference signal thereto; and

a comparator connected to said means to receive said difference signal, said comparator having an output connected to said selector and a blocking input of the servomotor whereby in response to said difference signal falling within a preset range of values, said comparator switches said selector output to said second selector input to deliver said deviation signal to said integral network and delivers a blocking signal to a blocking input of the servomotor.

4,408,149

SELF-OPTIMIZING VOLTAGE CONTROL OF AN INDUCTION MOTOR

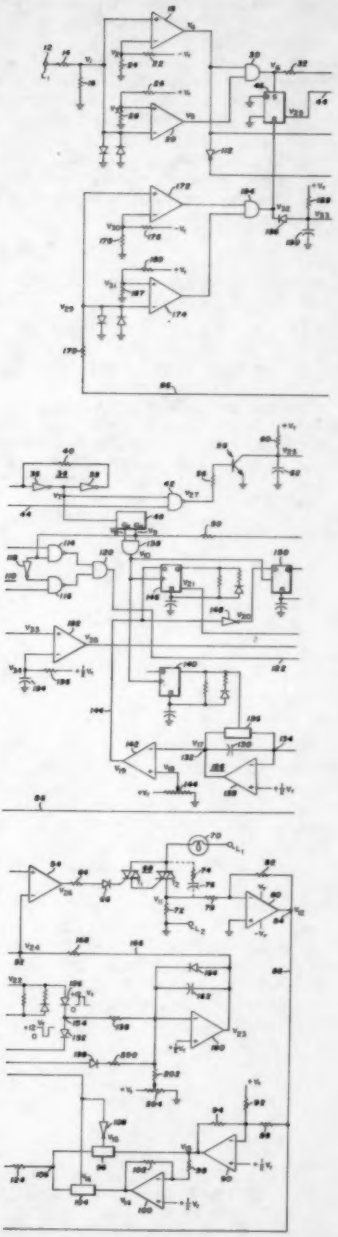
Thomas W. Collins, and Charles L. Croskey, both of State College, Pa., assignors to Optimizer Control Corporation, Burnsville, Minn.

Filed Sep. 8, 1981, Ser. No. 300,391

Int. Cl.³ H02P *1/44*

U.S. Cl. 318—729 **10 Claims**

1. In combination with an electric motor of the type having a triggerable electronic switching means connected in series with said motor and across a source of alternating current voltage, means for adaptively adjusting the firing angle of said electronic switching means relative to the zero-crossing of said alternating current voltage upon changes in loading on said motor to optimize the efficiency of said motor, comprising:



(a) first timing means for repetitively establishing a timing interval which is relatively long compared to the period of said alternating current voltage;

(b) second timing means adapted to be coupled to said trig-

gerable electronic switching means for setting said firing angle at an initial value at the beginning of each of said timing intervals;

(c) firing angle dithering means coupled to said triggerable electronic switching means and to said first timing means for perturbating said firing angle about said initial value;

(d) sampling means coupled to said motor for repetitively sampling the instantaneous power delivered to said motor at a rate which is high compared to the rate at which said firing angle is perturbated by said firing angle dithering means; and

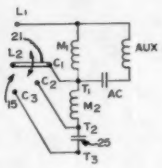
(e) means coupled between said sampling means and said second timing means for producing a signal for advancing or retarding said firing angle from said initial value depending upon the output from said sampling means.

4,408,150

SPEED CONTROL SYSTEM AND METHOD FOR ELECTRIC MOTOR

Roger W. Holston, and Carl P. Hinesley, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 151,679, May 20, 1980, abandoned.
This application Dec. 21, 1981, Ser. No. 332,879
Int. Cl.³ H02P *5/28*
U.S. Cl. 318—779 **15 Claims**



1. In an electric motor having at least one main winding, a multi-position speed selector switch for energization of the main winding of operation of the motor at high speed and one or more slower speeds, said motor being adapted to be connected to a source of line voltage, wherein the improvement comprises: capacitor means connected in series with one of said at least one main windings and being energizable by said speed selector switch when said one main winding is energized thereby to result in operation of said motor at a speed slower than when said one main winding is energized, said one main winding being energized by said line voltage when said motor is operated at high speed and being energized by a voltage less than said line voltage upon energization of said at least one main winding and said capacitor means when the motor is operated at said slower speed.

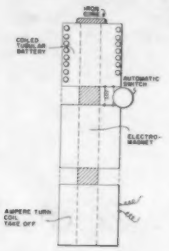
4,408,151

ELECTRIC POWER APPARATUS

Donald S. Justice, 1816 N. Queens La., Arlington, Va. 22201

Filed Oct. 14, 1977, Ser. No. 842,235
Int. Cl.² H01M *10/46*
U.S. Cl. 320—2 **1 Claim**

1. Electric power apparatus comprising the combination of a coiled tubular battery, an automatic switch, an electromagnet having a coil and a permeable core, and a secondary coil in common with the core, wherein the battery output is connected through the automatic switch to the electromagnet and



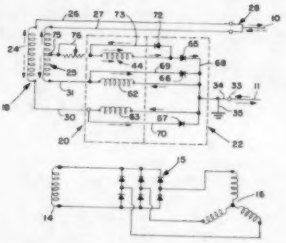
wherein the components are nested around the core whereby the unit ratio of the output to space is augmented.

4,408,152

SINGLE PHASE, SELF-REGULATED ALTERNATOR

Andrew F. Szippl, and Robert B. Walker, both of Lima, Ohio, assignors to The Lima Electric Co., Inc., Lima, Ohio

Filed Jun. 22, 1981, Ser. No. 275,968
Int. Cl.³ H02P *9/10;* **H02K** *19/3*
U.S. Cl. 322—29 **37 Claims**



1. A generator for producing a higher or lower voltage output comprising an alternator stator, an exciter stator, said exciter stator including two series windings, and means to energize both series windings every other half cycle at the lower voltage output and alternate series windings during every half cycle at the higher voltage output.

4,408,153

CURRENT SUPPLEMENTATION CIRCUIT FOR POWER SUPPLY

Michael B. Terry, Denton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

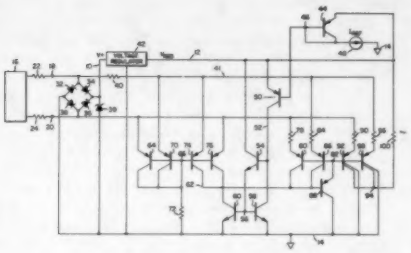
Filed Dec. 28, 1981, Ser. No. 335,147
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—224 **5 Claims**

1. A current supplementation circuit for operation in a system that receives a nonregulated voltage between first and second terminals and produces an essentially regulated voltage at a third terminal, the circuit comprising:

means for producing a reference current flowing from said third terminal to said second terminal, and

means responsive to said reference current for drawing an essentially constant current from said first terminal, said constant current split into first and second partial currents, said first partial current routed to said second terminal and said second partial current routed to said third terminal,

said means for drawing an essentially constant current establishing the amplitude of said second partial current



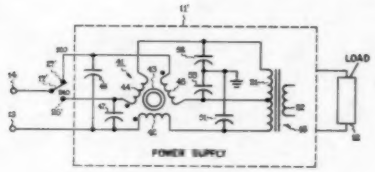
inversely to the amplitude of the voltage of said third terminal.

4,408,154

DUAL VOLTAGE POWER SUPPLY WITH INPUT FILTER

Paul T. Cote, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,833
Int. Cl.³ H02M *1/12*
U.S. Cl. 323—340 **5 Claims**



1. A filtered dual voltage power supply for receiving power from a single phase alternating current line having two terminals, comprising a three terminal input voltage means comprising a common input terminal and input terminals for two differing voltages, in which the improvement comprises a voltage selector means connected to a first one of said line terminals and having two output terminals, and an input filter having three windings on a common core, a first one of said windings being connected between said common terminal and the second one of said line terminals, and the second and third of said windings being respectively connected between said input terminals for differing voltages and said output terminals of the voltage selector means, said connection of the voltage selector means to the line terminal thereby preceding connection of the input filter thereto.

4,408,155

FAULT DETECTOR WITH IMPROVED RESPONSE TIME FOR ELECTRICAL TRANSMISSION SYSTEM

Joseph R. McBride, Mauldin, S.C., assignor to Bridges Electric, Inc., Heber Springs, Ark.

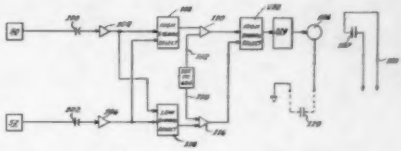
Filed Mar. 2, 1981, Ser. No. 239,344
Int. Cl.³ G01R *31/02, 19/00, 29/16*
U.S. Cl. 324—51 **15 Claims**

1. In a fault detector for an electrical transmission system having a conductor through which an alternating current flows and a sensor for monitoring the current flowing through said conductor, said sensor having an A.C. output signal proportional to the current and having positive and negative half cycles, an improved means for detecting a fault within one quarter of a fault current cycle, comprising:

a high signal selecting means for selecting the positive half cycle of said sensor signal;

means for comparing the signal selected by said high signal selector to a first reference signal;

a low signal selecting means for selecting the negative half cycle of said sensor signal;



means for comparing the signal selected by said low signal selector to a second reference signal; and

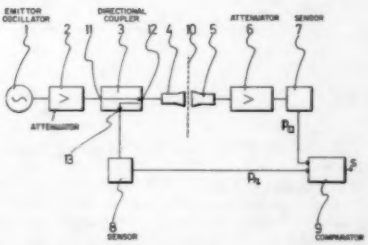
means for providing a fault indication signal if the signal selected by said high signal selector exceeds said first reference signal or if the signal selected by said low signal selector is less than said second reference signal.

4,408,156

SHEET ARTICLES OF NON-CONDUCTIVE MATERIAL MARKED FOR IDENTIFICATION PURPOSES, AND METHOD AND APPARATUS FOR IDENTIFYING SUCH ARTICLES

Pierre Veys, Wexford, Pa., assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Filed Apr. 9, 1980, Ser. No. 138,738
Claims priority, application United Kingdom, May 5, 1979, 7915193
Int. Cl.³ G01R *27/04*
U.S. Cl. 324—58.5 R **11 Claims**



1. A method of producing an identification signal for a sheet article of non-conductive material, which article is marked for identification purposes by the incorporation therein of a small quantity of very thin conductive fibers which are capable of absorbing and reflecting certain substantial proportions of microwave radiation energy impinging thereon, which comprises placing the part of said article in which the very thin conductive fibers are incorporated in the path of an unguided microwave beam, measuring the excess of microwave radiation energy arrested over the energy reflected and producing an output signal which is representative of the presence of such excess.

4,408,157

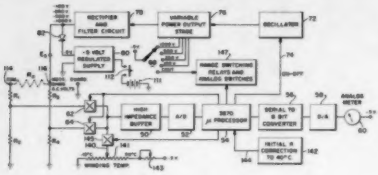
RESISTANCE MEASURING ARRANGEMENT

William H. Beaubien, Mundelein, Ill., assignor to Associated Research, Inc., Skokie, Ill.

Filed May 4, 1981, Ser. No. 260,303
Int. Cl.³ G01R *27/02*
U.S. Cl. 324—62 **39 Claims**

1. The method of measuring the resistance of an unknown

resistor which comprises the steps of measuring the voltage VR across a known resistor when said known resistor is connected to a source of voltage, measuring the voltage V'R across said known resistor when said known resistor is connected in series with an unknown resistor to said source of voltage, computing the quantity (VR/V'R)−1, and developing an output signal proportional to said computed quantity which corresponds to the resistance value of said unknown resistor.

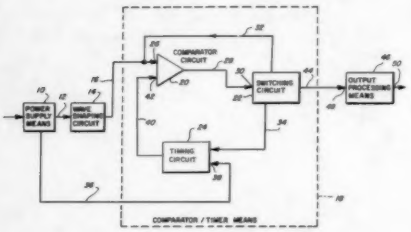


4,408,158

FREQUENCY TRANSDUCER

Roy S. Brozovich, Oldsmar, and Prentice G. Moore, Clearwater, both of Fla., assignors to Square D Company, Palatine, Ill.

Filed Oct. 5, 1981, Ser. No. 308,767
Int. Cl.³ G01R *23/02*
U.S. Cl. 324—78 R **7 Claims**



1. A transducer for monitoring frequency in a power line comprising:

a. power supply means for supplying operating and reference voltages to various components of the transducer and for producing a power representative signal and a constant voltage signal, said power supply means being connected to said power line and receiving input therefrom, and said power representative signal having a frequency which is a multiple of the frequency of the input from the power line;

b. wave shaping means for producing a triggering output signal equal in frequency to the frequency of said power representative signal, said wave shaping means being connected to said power supply means and receiving said power representative signal as input;

c. comparator/timer means for producing a frequency representative signal, said comparator/timer means further comprising:

(1) switching means for switching between two of said reference voltages in response to a frequency representative signal to produce a stabilized frequency representative signal, and for providing on-off status control of a timing means, said switching means receiving said frequency representative signal as an input, and producing said stabilized frequency representative signal as an output;

(2) timing means for providing a reference signal, said timing means' on-off status being controlled by said switching means, said timing means being connected to said switching means and to said power supply means, and receiving said constant voltage signal from said power supply means; and,

(3) comparator means for comparing said triggering output signal and said stabilized frequency representative signal at a first input with said reference signal at a second input for producing said frequency representative signal, said comparator means being connected to said wave shaping means and receiving said triggering output signal as an input therefrom, connected to said switching means, and receiving said stabilized frequency representative signal as a feedback input therefrom, connected to said timing means and receiving said reference signal as an input therefrom, and connected to said switching means, and providing said frequency representative signal as an output thereto; and,

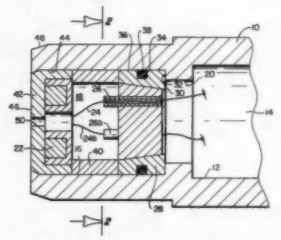
d. output processing means for producing an averaged frequency representative signal which is proportional to the frequency of the input from the power line, said output processing means being connected to said switching means of said comparator/timer means and receiving the stabilized frequency representative signal as input.

4,408,159

PROXIMITY SENSING HEAD

Rolf Prox, Mettmann, Fed. Rep. of Germany, assignor to Abex Corporation, New York, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,516
Int. Cl.³ G01V *3/11*
U.S. Cl. 324—207 **2 Claims**



1. An inductive proximity sensor which comprises a sensor housing, a first cavity formed in one end of the housing, a second cavity formed in the housing adjacent the first cavity, a plurality of components forming an oscillator control circuit positioned in the second cavity, a sensing head positioned in the first cavity, the sensing head including an oscillator coil assembly and a cover which closes the first cavity, a seal assembly positioned between the oscillator coil assembly and the second cavity, a fluid passage between the outside of the housing and the first cavity to permit fluid to flow into the first cavity and around the coil assembly to thereby pressure balance the coil assembly, and wherein the seal assembly prevents the passage of fluid from the first cavity into the second cavity.

4,408,160

ACOUSTIC BARKHAUSEN STRESS DETECTOR APPARATUS AND METHOD

James D. King; Gary L. Burkhardt; John R. Barton, and George A. Matzkanin, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

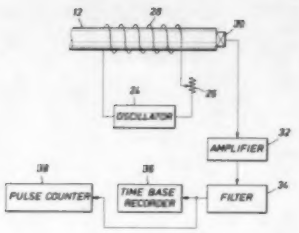
Filed Apr. 8, 1981, Ser. No. 252,246
Int. Cl.³ G01B *7/24*; G01N *27/72*; G01R *33/12*
U.S. Cl. 324—209 **28 Claims**

18. Apparatus for measuring stress in a ferromagnetic specimen comprising:

(a) magnetic field forming means forming a field characterized by a minimum and a maximum flux value and which

means is adapted to form flux in a specimen fully thereacross;

(b) acoustic vibration sensor means operatively coupled to the specimen to detect acoustic vibrations of a specified pulse width size on change of flux value and such acoustic vibrations are received fully thereacross;



(c) amplifier means connected to said acoustic vibration sensor means for amplifying individual pulses representative of the acoustic vibrations; and

(d) an indicating means connected to said amplifier means for measuring stress within the material, as a function of said amplified pulses.

4,408,161

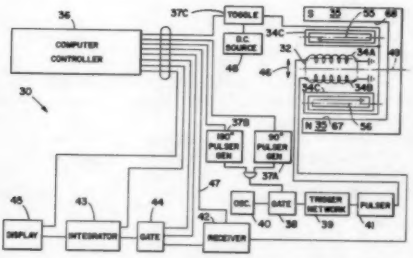
COMPUTER-CONTROLLED, PORTABLE SPIN ECHO NMR INSTRUMENT AND METHOD OF USE

Robert J. S. Brown, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 15, 1981, Ser. No. 255,976

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—303 **17 Claims**



1. Automatic apparatus for determining permeability properties of a carbonate sample based on spin echo diffusion response of hydrogen nuclei of interstitial fluids within pore spaces of said samples comprising:

(a) magnet means for producing a DC magnetic field acting on said carbonate sample, said magnetic field having an intensity of at least 1 kilogauss and an inhomogeneity of at least D gauss to aid providing nuclear magnetization build-ups associated with said interstitial fluids within said sample as a function of time;

(b) RF coil means acting at right angles to said DC magnetic field;

(c) transmitter means including digital control means for generating first and second series of digital control codes associated with 90° and 180° RF magnetic pulses of selected frequency, amplitude and duration, connected to said RF coil means to produce a series of pairs of 90° and 180° RF magnetic pulses for interrogating said sample to obtain spin echo diffusional responses of said fluid within said sample, said amplitude of each pulse being controlled to be at least greater than the variation D in said DC field over said sample;

(d) gradient DC coil means connected to generating a series of gradient DC fields across said sample as a function of a third series of control pulses; and

(e) receiver means connected to said digital control means and to said RF coil means for detecting as a function of a fourth series of digital control code associated with a plurality of time windows, output signals proportional to said spin echo diffusional responses of said interstitial fluids whereby said responses can be meaningfully related to permeability of said sample.

4,408,162

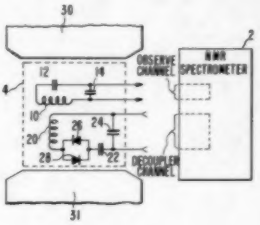
SENSITIVITY NMR PROBE

Herman Egger, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 22, 1980, Ser. No. 219,287

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—318 **3 Claims**



1. An NMR spectrometer comprising:

a probe;

a receive channel further comprising a receive coil within said probe;

a decoupler channel further comprising a decoupler coil within said probe and disposed in proximity to said receive coil, said decoupler connected in series with a pair of RF diodes, said diodes connected cathode-to-anode, whereby said decoupler circuit is an open circuit for sufficiently small signals coupled in said decoupler circuit from said receive coil.

4,408,163

METHOD AND APPARATUS FOR DETERMINING BEAM DIMENSIONS AT THE SCREEN OF A SHADOW MASK CATHODE-RAY TUBE

Peter Burr, Winchester, all of; Brian D. Chase; Andrew Paton, both of Eastleigh, and Brian R. Sowter, Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1980, Ser. No. 212,284

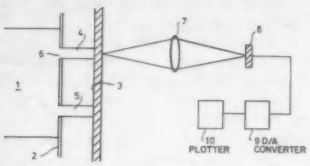
Claims priority, application United Kingdom, Dec. 7, 1979, 7942391

Int. Cl.³ G01R *31/024*

U.S. Cl. 324—404 **8 Claims**

1. A method of determining the beam cross-sectional dimensions and light output at the screen of a shadow mask cathode-ray tube, comprising the steps of arranging a detector to detect light emitted due to a portion of the beam passing through a

single aperture in the shadow mask, deflecting the beam incrementally so that the whole cross-sectional area of the beam is



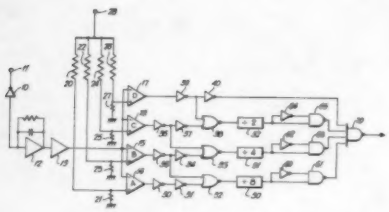
scanned across the said aperture, and recording the light output received by the detector while said beam is stationary.

4,408,164

COMPENSATION CIRCUIT FOR RADIATION DETECTORS

Phillip C. East, Nepean, and Malcolm S. McGowan, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, Ottawa, Canada

Filed Sep. 1, 1981, Ser. No. 298,373
Claims priority, application Canada, Sep. 18, 1980, 380687
Int. Cl.³ H03K *5/24, 13/09*
U.S. Cl. 328—117 **4 Claims**



1. A signal processing circuit for use with a proportional radiation detector comprising: circuit means defining a plurality of different channels; logic means coupled to pulses from said detector to direct said pulse to one of said channels according to the amplitude of said pulse so that each channel receives a different range of pulse amplitudes; pulse-dividing means in each channel except the channel receiving pulses in the highest range, each said pulse-dividing means reducing the number of pulses at the respective channel output by a factor which is a function of the average amplitude of the pulses received by that channel; summing means connected to the output of each channel to provide an output pulse train whereby the count rate of the output pulse train is indicative of the dose rate of radiation incident on the detector.

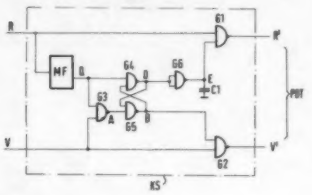
4,408,165

DIGITAL PHASE DETECTOR

Reinhold Braun, Stuttgart, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,831
Int. Cl.³ H03D *13/00;* **H03K** *5/26*
U.S. Cl. 328—134 **7 Claims**

1. In a digital phase detector having two inputs and two outputs for a phase-locked-loop (PLL) system with a reference signal and a comparison signal, in which the reference signal is capable of being applied to the first input and in which the comparison signal is capable of being applied to the second input, and in which the first output delivers a first output signal whenever the reference signal, in its phase, leads the comparison signal, and the second output delivers a second output signal whenever the reference signal, in its phase, lags behind the comparison signal, with the pulse widths of these output signals each being in proportion to the value of the phase shift between the reference signal and the comparison signal, the improvement comprising that the inputs of said phase detector (PDT) are preceded by a correction circuit (KS) having two inputs and two outputs, with the outputs of said correction circuit (KS) being connected to the inputs of said phase detector (PDT), with both said reference signal (R) and said comparison signal (V) capable of being applied to the inputs of said



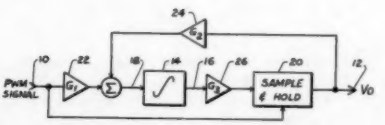
correction circuit (KS), and that said correction circuit (KS), following an interruption of said reference signal (R), includes means for switching its inputs to its outputs such that the trailing edges of both said reference signal (R) and said comparison signal (V) are switched through simultaneously, or that the trailing edge of said reference signal (R) is switched through subsequently to the trailing edge of said comparison signal (V).

4,408,166

PULSE WIDTH MODULATION DECODER

Roy P. Moeller, Hayward, Calif., assignor to Altex Scientific, Inc., Berkeley, Calif.

Continuation of Ser. No. 220,869, Dec. 29, 1980, abandoned.
This application Jun. 14, 1982, Ser. No. 388,315
Int. Cl.³ H03K *9/08*
U.S. Cl. 329—106 **8 Claims**



1. Apparatus for decoding a pulse width modulated (PWM) signal which alternates between first and second values comprising:

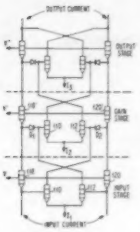
an integrator circuit, responsive to the PWM signal and a decoder output signal, for producing an integrator output signal whose value equals the sum of a first value proportional to the time integral of the PWM signal and a second value proportional to the time integral of the decoder output signal; and

a sample-and-hold circuit, responsive to the PWM signal and the integrator output signal, for producing the decoder output signal proportional to the value of the integrator output signal at the time of the most recent transition of the PWM signal from its second value to its first value.

4,408,167
CURRENT AMPLIFIER STAGE WITH DIODE INTERSTAGE CONNECTION

Dennis L. Rogers, Croton on Hudson, and Albert X. Widmer, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,775
Int. Cl.³ H03F 3/45
U.S. Cl. 330—261 4 Claims



1. A multi-stage current mode differential amplifier having an input stage and a plurality of cascaded stages, characterized by each cascaded stage, comprising:

a pair of input transistors;

a pair of control transistors;

four input lines;

four output lines adapted to be connected to the input lines of the succeeding stage; and

first and second diode devices;

said four output lines extending respectively from the collectors of said four transistors;

two of said input lines being connected respectively to the emitters of said input transistors;

the other two of said input lines being connected respectively to the bases of said control transistors;

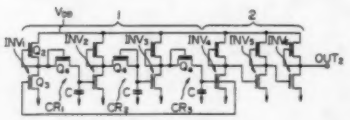
the emitter of each said control transistor being connected to a common current source and the base of each said input transistor being connected to a common bias voltage source;

each said diode device being connected between the base of one of said control transistors and the emitter of one of said input transistors, whereby the load impedance at each said control transistor in one stage is effectively increased by the diode device in the succeeding stage without requiring a corresponding increase in bias voltage for said succeeding stage relative to the bias voltage for said preceding stage.

4,408,168
DELAY CIRCUIT OSCILLATOR HAVING UNEQUAL ON AND OFF TIMES

Mitsuo Higuchi, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,676
Claims priority, application Japan, Nov. 29, 1979, 54-154579
Int. Cl.³ H03K 3/03, 3/354
U.S. Cl. 331—57 6 Claims



1. An oscillator circuit for providing an oscillating output having a duty ratio significantly different from 50%, comprising

a delay circuit, the output of said delay circuit being provided to the input of said delay circuit as positive feedback,

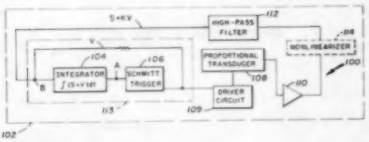
said delay circuit including a plurality of successively connected delay stages, wherein a signal corresponding to the output of each said delay stage is provided to the input of the successive delay stage, and a signal corresponding to the output of the last one of said delay stages is provided as said positive feedback to the input of the first one of said delay stages,

each said delay stage comprising a series connection of an inverter and a time constant circuit, each said time constant circuit comprising a resistance provided by a first depletion type MOS transistor and a capacitor connected in series, each said first depletion type MOS transistor being connected so that a difference in the delay time is provided within each said delay stage depending upon whether the portion of a signal being delayed is a rising or falling waveform, the respective connection of each said first depletion type MOS transistor of each said delay stage being such that all the differences in all the stages are added to provide said duty ratio significantly different from 50%.

4,408,169
FREQUENCY ENCODING CLOSED LOOP CIRCUIT WITH TRANSDUCER

Allan B. Fraser, Woodbine, Md., assignor to The John Hopkins University, Baltimore, Md.

Filed May 18, 1981, Ser. No. 264,952
Int. Cl.³ G01N 27/00
U.S. Cl. 331—65 20 Claims



1. A method for producing an output frequency which is a function of the amplitude of a varying physical quantity acting on a transducer having an output impedance, the method comprising the steps of:

generating, in a relaxation oscillator with an input impedance, a digital drive signal at the output frequency;

driving the transducer with a function of the digital drive signal and producing an amplitude modulated bilevel signal in-phase with the drive signal and having an amplitude which is a function of the amplitude of the physical quantity sensed by the transducer;

isolating the output impedance of the driven transducer from the input impedance of the relaxation oscillator;

combining the drive signal and the amplitude modulated bilevel signal, thereby providing a composite signal; and

feeding the composite signal back as the input to the relaxation oscillator.

4,408,170
COMPONENT WITH TRIMMABLE ELECTRIC IMPEDANCE

Juha Rapeli, Kuikkatie 4 E 6, 90150 Oulu 15, and Seppo Leppävuori, Hiukkavaarantie 1 A 9, 90650 Oulu 65, both of Finland

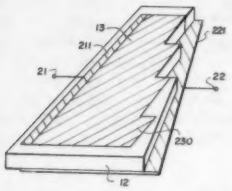
PCT No. PCT/FI81/00017, § 371 Date Oct. 23, 1981, § 102(e) Date Oct. 23, 1981, PCT Pub. No. WO81/02652, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 11, 1981, Ser. No. 315,533

Claims priority, application Finland, Mar. 11, 1980, 800740

Int. Cl.³ H03H *1/02, 3/00*

U.S. Cl. 333—172 **10 Claims**



1. An electric component with trimmable complex resistive-capacitive impedance comprising:

a first resistor layer forming a ground plane;

an insulation layer connected over said ground plane; and

a second resistor layer connected connected over said insulation layer and divided into a plurality of resistor layer portions that are selectively connected and disconnected from each other to produce a selected resistive-capacitive impedance, the second resistor layer having a drive point conductor connected along one edge thereof and having an opposite edge which is step shaped to produce said resistor layer portions which have varied lengths and widths according to said step shaped edge.

4,408,171
NOISE FILTER WITH SOCKET ATTACHED THERETO

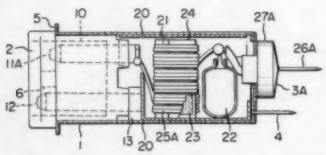
Tadaharu Akino, Kashiwa; Akira Nakamura, Funabashi, and Hiroyuki Uemura, Narashino, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,607

Claims priority, application Japan, Mar. 13, 1980, 55-31879[U]

Int. Cl.³ H03H *7/01, 7/09*

U.S. Cl. 333—177 **5 Claims**



1. A noise filter comprising;

a casing made of metallic material;

a power input socket having a pair of power input contacts and a grounding contact that is mounted on one of the walls of said casing and is electrically coupled to said casing;

a pair of feed through type capacitors, each including a ground conductor mounted on another wall of said casing and a center rod that extends outwardly to serve as a power output contact;

a choke coil with a pair of windings mounted in said casing;

a capacitor mounted in said casing and electrically coupling together said center rods of said feed through capacitors;

each of said power input contacts being electrically coupled to a center rod of said feed through type capacitor by an individual one of said windings.

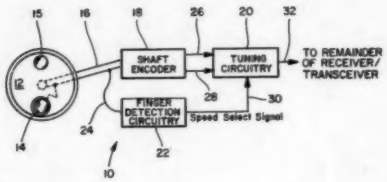
4,408,172
VARIABLE SPEED TUNING SELECTOR

Terry A. Perdue, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Oct. 8, 1981, Ser. No. 309,666

Int. Cl.³ H03J *1/14, 1/22, 3/02*

U.S. Cl. 334—11 **8 Claims**



1. A system for controlling the rate of change in frequency of a variable speed tuner in tuning to a selected frequency, said system comprising:

user selectable rotary control means;

detector means coupled to said tuner and to said rotary control means and responsive to the rotation thereof for providing a plurality of pulses to said tuner representing a first tuning rate; and

touch sensitive means including conductive finger receptacle means integral with said rotary control means and coupled to said tuner for providing a control signal to said tuner when touched by a user for changing the tuning speed of said tuner to a second tuning rate in response thereto.

4,408,173
ELECTRIC SWITCH

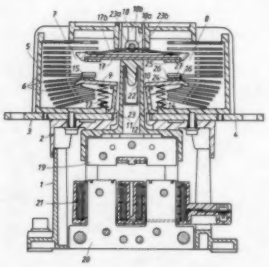
Bo Adlerteg, and Lennart Grees, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Oct. 28, 1981, Ser. No. 315,901

Claims priority, application Sweden, Oct. 30, 1980, 8007633

Int. Cl.³ H01H *73/00, 77/00*

U.S. Cl. 335—16 **9 Claims**



1. An electromagnetically operable electric switch having a predetermined current rating comprising:

at least one breaking unit comprising:

a first openable contact system; and

a second openable contact system electrically series connected to said first openable contact system;

said first openable contact system comprising:

a movable first contact;

a fixed second contact; and

electromagnetic means controlling engagement of said first contact with said second contact;

said second openable contact system comprising:

a movable third contact normally engaged with said fixed second contact and disengageable from said fixed second contact exclusively in response to electrodynamic forces created by the passage of a current through said switch greater than ten times said predetermined current rating and comprising a second material having properties suitable for interrupting short circuit currents;

said fixed second contact being disposed intermediate said first and third contacts and comprising:

a first contact element forming a part of said first contact system and comprising a first material suitable for making and breaking currents occurring during normal operation of said switch; and

a second contact element forming a part of said second contact system and electrically connected to said first contact element and comprising said second material different from said first material.

4,408,174

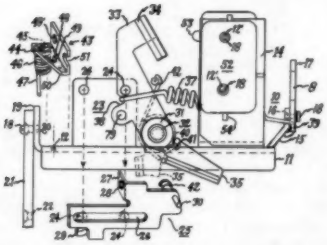
ACCESSORY MOUNTING MODULE FOR J AND K FRAME BREAKERS

Raymond K. Seymour, and Dennis J. Doughty, both of Plainville, Conn., assignors to General Electric Co., New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,109

Int. Cl.³ H01H *83/00*

U.S. Cl. 335—20 **19 Claims**



1. An accessory mounting module for circuit breakers comprising:

a base having a pair of upright posts for carrying an electrical accessory device and including means at one end for receiving a locating pin on a circuit breaker and means at an opposite end for fastening said base to said circuit breaker;

a reset lever pivotally and vertically mounted on said base having a lever arm at one end for actuating said accessory device and an actuator arm at another end for contacting a circuit breaker tripping arm;

a trip assembly slidably mounted on a pair of cams extending from a bracket attached to said base and attached to a trip mechanism on said circuit breaker; and

latch means on said base carrying a detent for engaging with said trip assembly to hold said trip assembly against a trip spring force until said latch means is pivoted by operation of a solenoid to move said detent away from said trip assembly causing said trip assembly to move said circuit breaker trip mechanism to trip said breaker.

4,408,175

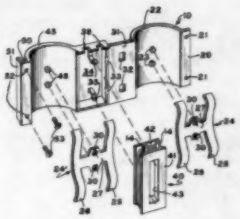
SELF CENTERING CURRENT RESPONSIVE PICKUP MEANS

Marvin D. Nelson, St. Louis Park, and B. Hubert Pinckaers, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 18, 1982, Ser. No. 340,416

Int. Cl.³ H01F *27/02*

U.S. Cl. 336—92 **10 Claims**



1. A current responsive pickup means adapted to be resiliently mounted on a conductor carrying an electric current to sense said electric current, inclding: nonmagnetic housing means with said housing means being capable of encircling said conductor; said housing means including a recessed portion and a cover portion with said portions forming a pickup means mounting chamber with said cover portion closing over said recessed portion when said housing means encircles said conductor; a pair of resilient guide means mounted on said housing means with said pair of guide means displaced from each other so that upon said housing means being closed around said conductor said pair of resilient guide means mounting said housing means resiliently upon said conductor by said resilient guide means being compressed by said housing means against said conductor; a bobbin having a pickup coil wound upon said bobbin to form said pickup means; said pickup means placed in said pickup means mounting chamber prior to said housing means being closed around said conductor; and retainer means attaching opposite ends of said housing means in engagement to resiliently hold said housing means to said conductor with said pickup coil in proximity to said conductor to sense the presence of current in said conductor.

4,408,176

FLYBACK TRANSFORMER

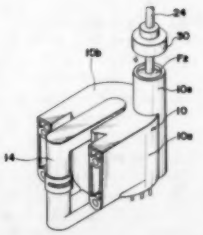
Kengi Nakamura, Katano, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 12, 1981, Ser. No. 242,986

Claims priority, application Japan, Mar. 12, 1980, 55-32952[U]

Int. Cl.³ H01F *27/04*

U.S. Cl. 336—107 **13 Claims**



1. A electrical connecting apparatus for use in effecting an electrical connection between an electrical device positioned

within a casing and a lead wire extending from said casing, said electrical connecting apparatus comprising:

a chamber formed within a casing, said device being positioned within said casing, said casing having at least one guide opening that communicates from the chamber to the outside of said casing;

a tongue portion extending from said device, said tongue portion having an opening defined therein, said opening being in alignment with said guide opening;

a cap member made of an electrically conductive material and having a body portion and a bore defined therein, one end of said bore being opened, said cap member being inserted into said opening of said tongue portion with said open end of said bore facing said guide opening;

electrical connecting means for connecting said cap member and said device;

wherein a lead wire extending from the casing has one end portion inserted into said bore through said guide opening for effecting an electric connection between said lead wire and said device, and the other end portion of said lead wire extending outwardly from the casing; and

a cast-in material injected into said chamber.

2. A flyback transformer comprising:

a casing having a chamber formed therein and at least one guide opening that communicates from the chamber to the outside of said casing;

a coil-block housed in said chamber of said casing, said coil-block comprising:

(i) at least one bobbin having a tongue portion extending from said bobbin, said tongue portion having an opening defined therein, said opening being in alignment with said guide opening;

(ii) a series of coils wound on said bobbin;

(iii) a cap member made of an electrically conductive material having a body portion and a bore defined therein, one end of said bore being opened, said cap member inserted into said opening of said tongue portion with said open end of said bore facing said guide opening; and

(iv) electrical connecting means for connecting said cap member and one of said coils;

lead wire having one end portion inserted into said bore through said guide opening for effecting an electric connection between said lead wire and said coil, and the other end portion of said lead wire extending outwardly from the casing; and

a first cast-in material injected into said chamber.

4,408,177

VARIABLE INDUCTOR HAVING EXTENDED USEABLE FREQUENCY RANGE

Jack C. Thornton, Satellite Beach, Fla., and Randy G. Russell, Arlington Heights, Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

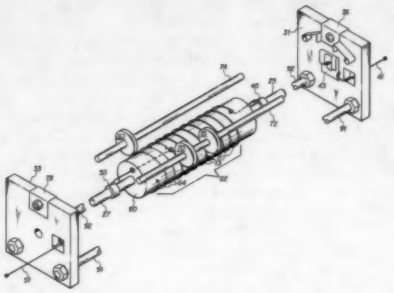
Filed Apr. 1, 1982, Ser. No. 364,293
Int. Cl.³ H01H *51/08*
U.S. Cl. 336—139 **6 Claims**

1. A variable inductor comprising:

rotatable, substantially helical coil means comprising first and second coil portions situated substantially end to end, said first coil portion comprising multiple turns of electrical conductor, said second coil portion comprising an electrically non-conductive extension of said first coil portion such that said first and second coil portions together serve substantially as a mechanical worm;

a plurality of moveable contactors located exteriorly of said coil means and each comprising conductive means for, as the coil means is rotated, (i) continuously contacting said coil means one turn at a time and (ii) traveling substantially parallel to the side of the coil means;

said contactors being situated relative to one another such that in a first tuning condition, two of the plurality of contactors may simultaneously contact the first coil portion, and such that in a second tuning condition one of the



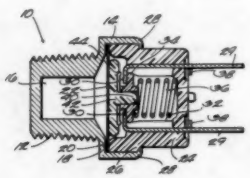
same two contactors may contact the first coil portion while the other contacts the second coil portion.

4,408,178

THERMOSTATIC SWITCH

Tore B. Hanssen, Hoffman Estates, and Chester S. Zwirek, Elmhurst, both of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 12, 1982, Ser. No. 397,140
Int. Cl.³ H01H *37/40*
U.S. Cl. 337—320 **4 Claims**



1. A temperature responsive switch assembly comprising,

a heat conducting body,

a switch housing mounted on the body,

a diaphragm between the housing and the body,

a chamber in the body on one side of the diaphragm,

switch means in the housing,

a diaphragm pad on the other side of the diaphragm operative to actuate the switch means,

a spring opposing movement of the pad to actuate the switch in response to increasing pressure in the chamber,

a temperature responsive liquid charge in said chamber having a boiling point below the temperature at which the switch is operated whereby the charge is in the liquid/vapor state at the switch operating temperature.

4,408,179

COMMUNICATIONS SYSTEM FOR AUTOMOTIVE VEHICLES

Akira Matsumura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

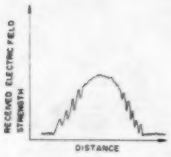
Division of Ser. No. 133,259, Mar. 24, 1980, Pat. No. 4,359,712.
This application Jun. 8, 1981, Ser. No. 271,229
Claims priority, application Japan, Mar. 26, 1979, 54-35387
Int. Cl.³ G08G *1/00, 1/12;* G08C *21/00*
U.S. Cl. 340—32 **2 Claims**

1. A communications system for automotive vehicles, which comprises:

(a) a fixed communications unit which transmits an area

signal at all times and an information signal if requested; and

(b) a mobile communications unit which transmits a request signal when the area signal is received within a communications area, and receives the information signal from said fixed unit in accordance with the request signal, the electric field strength transmitted from said fixed communications unit being predetermined higher than that transmitted from said mobile communications unit in the case where the threshold level determined in said fixed communications unit for receiving signals transmitted from said mobile communications unit is equal to the threshold level determined in said mobile communications unit for receiving signals transmitted from said fixed communications unit.



4,408,180

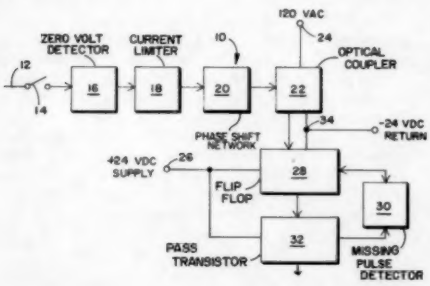
TRAFFIC SIGNAL LIGHT INTENSITY CONTROL

Ramey B. Metz, 18605 S. Mesa Dr., Villa Park, Calif. 92667

Continuation-in-part of Ser. No. 184,966, Sep. 8, 1980, abandoned. This application Nov. 21, 1980, Ser. No. 208,989

Int. Cl.³ G08G *1/00*; H05B *37/02*; H03K *19/14*

U.S. Cl. 340—40 **5 Claims**



1. A circuit capable of reducing power consumed by all of the signal lights at a street intersection, comprising:

activating switching means to activate the circuit;

timing current interruption means turned on by the activating means, which timing current interruption means inhibit the 24 volt low voltage supply to load switches of the selected signal lights, thereby preventing the power normally supplied to the signal lights from being supplied to the signal lights while the 24 volt low voltage supply as inhibited, wherein the activating switching means comprises at least one of the following:

a timer,

a light intensity detector,

signals from signal means coupled to the timing current interruption means to selectively activate and deactivate the timing current interruption means.

4,408,181

DOCUMENT DATA FILING/RETRIEVAL SYSTEM

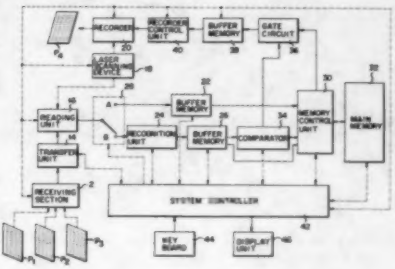
Naoto Nakayama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 9, 1980, Ser. No. 138,508

Claims priority, application Japan, Apr. 10, 1979, 54-43367; Apr. 16, 1979, 54-46483

Int. Cl.³ G06K *9/00*; G06F *7/10*

U.S. Cl. 82—61 **7 Claims**



1. A document data filing and retrieval system used with an index data list bearing the index data associated with the document data in a plurality of documents to be filed, and a retrieval data list bearing the index data associated with the document data in a plurality of documents to be retrieved, comprising:

a single read means for optically reading the document data on the documents and the associated index data on the index data list and the retrieval data list;

a first buffer memory for temporarily storing the document data read by said read means;

recognizing means for recognizing the index data read by said read means;

a second buffer memory for temporarily storing the index data recognized by said recognizing means;

switch means coupling said first and second memories to said single read means for supplying said document data to said first buffer memory and said index data to said second buffer memory;

a main memory; and

memory control means for loading into said main memory the document data from said first buffer memory and the associated index data from said second buffer memory.

4,408,182

LIGHTING AND MORSE CODE SIGNALING DEVICE

Kazuo Hashimoto, No. 28-2 Komazawa, and Mutsuo Konno, No. 26-7 setagaya 4-chome, both of Setagaya-ku, Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,511

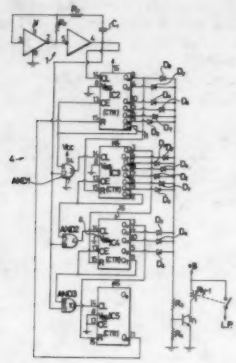
Claims priority, application Japan, Aug. 5, 1980, 55-106713

Int. Cl.³ G08B *5/31*; H05B *41/34*

U.S. Cl. 340—321 **2 Claims**

1. A lighting and S.O.S. Morse code signaling device device, comprising a lamp and means for selectively connecting said lamp to a power source, said connecting means including means for selecting among an unlit mode, a continuous lighting mode and an intermittent lighting mode; means operative during said intermittent lighting mode for generating constant pulse repetition rate pulses; plural decade counters for counting said pulses during said intermittent lighting mode and having an output terminal corresponding respectively to each count value; and means for controlling said lamp to develop an S.O.S. Morse code signal including means for driving said lamp initially by alternate terminals in succession of said plural decade counters to develop three successive "dot" signals, then by three sets successively of three successive terminals,

with one unused terminal between each set, of said plural decade counters to develop three successive "dash" signals and



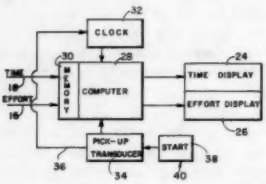
then by alternate terminals in succession of said plural decade counters to develop three successive "dot" signals.

4,408,183

EXERCISE MONITORING DEVICE

Thomas A. Wills, 2113 Mt. Vernon St., Philadelphia, Pa. 19103

Filed Jun. 6, 1977, Ser. No. 803,593
Int. Cl.³ G08B 5/00; A63B 23/00
U.S. Cl. 340—323 R **7 Claims**



1. A monitoring device enabling a human user to compare elapsed time with effort performed comprising:

separate graph generating means which are similar in nature to provide generation of graph patterns in proportion to elapsed time and in proportion to effort, respectively, and positioned adjacent and relative to one another such that the elapsed time and effort generations can be visually directly compared,

clock means generating repetitive timing signals,

pickup transducer means sensing efforts and generating signals representative thereof, and connected by linkage means for starting the clock means by an initiating impulse,

completed effort cycle selection means to select a scale for the effort graph pattern,

time period selection means to select the scale of the total elapsed time graph pattern, and

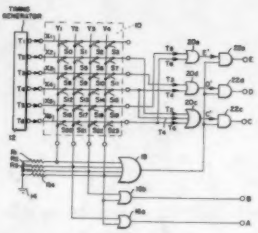
selective activation means, including computer means, connected to and permitting the respective graph patterns to receive and record timing signals from the clock means and effort signals from the pickup transducer means.

4,408,184

KEYBOARD SWITCH CIRCUIT

Jun Ishii, Yokohamashi, Japan, assignor to Tokoy Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 18, 1980, Ser. No. 170,179
Claims priority, application Japan, Aug. 24, 1979, 54-107941
Int. Cl.³ G06F 3/02
U.S. Cl. 340—365 S **34 Claims**



1. A keyboard switch circuit comprising:

a switch matrix circuit having 2^m columns and $(2^{n-1}+2)$ to 2^n rows, where m and n represent positive integers greater than or equal to 2, and a plurality of key switches, each key switch being connected across a particular one of said columns and a particular one of said rows:

circuit means for sequentially applying pulses to the respective rows;

a first set of m logic gates each connected to selected ones of 2^{m-1} columns;

a logic circuit having 2^m inputs each connected to a different one of said columns;

a second set of n logic gates each connected to a selected one or ones of the rows;

a third set of n logic gates each having first and second inputs, said first inputs of said third set of logic gates each being connected to the output of a different one of the second set of logic gates, and said second inputs being connected to the output of said logic circuit having 2^m inputs, whereby each logic gate of said third set of logic gates in ON only when the logic state of the gate of the second set of logic gates connected to the logic gate and the logic state of the logic circuit having 2^m inputs are coincident with each other; and

(m+n) outputs each producing a different digit of a binary coded signal associated with the operation of a specific key switch, in which m outputs are the respective outputs of the first set of logic gates and n outputs are the respective outputs of the third set of logic gates.

4,408,185

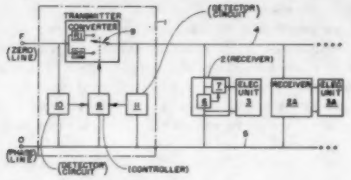
PROCESS FOR TRANSFERRING INFORMATION AND SYSTEM FOR CARRYING OUT THE PROCESS

Jorgen B. Rasmussen, Copenhagen, Denmark, assignor to Elsmark A/S, Denmark

PCT No. PCT/DK79/00049, § 371 Date Jul. 11, 1980, § 102(e) Date Jul. 11, 1980, PCT Pub. No. WO80/01024, PCT Pub. Date May 15, 1980
PCT Filed Nov. 13, 1979, Ser. No. 201,024
Claims priority, application Denmark, Nov. 13, 1978, 5031/78
Int. Cl.³ H04M 11/00; H04Q 5/00
U.S. Cl. 340—310 A **7 Claims**

1. A process for transferring information between electrical devices interconnected via at least two power supply lines which at least carry an alternating supply current, and wherein current in a power supply line is at least partially blocked for transferring information, characterized by the operation that depending upon a first type of information to be transferred, current flow in a power supply line is blocked at least partially

in positionally determined periods constituting a fraction of a halfwave interval, and that a second type of information is



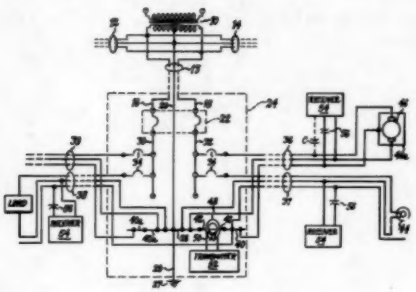
transmitted on the power supply lines from at least one of the devices in at least one of said positionally determined periods.

4,408,186

POWER LINE COMMUNICATION OVER GROUND AND NEUTRAL CONDUCTORS OF PLURAL RESIDENTIAL BRANCH CIRCUITS

Edward K. Howell, Simsbury, Conn., assignor to General Electric Co., New York, N.Y.

Filed Feb. 4, 1981, Ser. No. 231,632
Int. Cl.³ H04M *11/04*
U.S. Cl. 340—310 A **15 Claims**



1. A power line communication system for signalling over a low voltage AC power distribution system for distributing electrical power at an AC power frequency throughout a building, wherein the power distribution system includes a load center and a plurality of branch circuits, the load center having at least one main busbar to which a main of a service entry feed is connected and a neutral bus to which a neutral cable of the service entry feed is connected, the neutral bus being solidly clamped to ground potential, each branch circuit having a line conductor electrically connected with the main busbar and a neutral conductor terminated in electrical connection with the neutral bus, said communication system comprising, in combination:

A. a ground bus included in the load center;

B. a tie conductor electrically connecting said ground and neutral buses in common;

C. a signal communication link consisting of at least one of the branch circuits, said one branch circuit including, in addition to a line conductor and a neutral conductor, a ground conductor terminated in electrical connection with said ground bus and otherwise electrically isolated from the neutral conductor thereof downstream from the load center;

D. a transmitter for transmitting voltage signals of a frequency greater than the power frequency and coupled onto said communication link;

E. a receiver tuned to said voltage signals and coupled onto said communication link; and

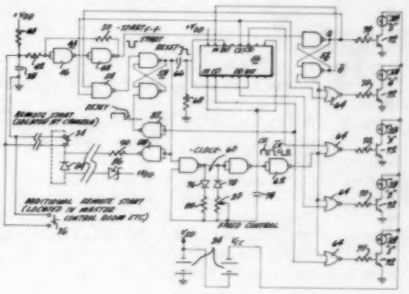
F. inductive means associated with said tie conductor to introduce an impedance between said ground and neutral buses at the signal frequency such as to accomodate the propagation of voltage signals along said one branch circuit between said transmitter and receiver, said voltage signals being precluded from propagating onto the neutral cable of the service entry feed by virtue of the neutral bus being clamped to ground potential at the voltage signal frequency.

4,408,187

CUEING DEVICE

Edward J. Rollins, P.O. Box 523, Meadow Vista, Calif. 95722

Filed Dec. 1, 1980, Ser. No. 212,080
Int. Cl.³ G08B *5/00*; H05B *39/00*
U.S. Cl. 340—332 **10 Claims**



1. A cueing device for use in providing a visual cueing signal to a performer, including

a plurality of visual indicators arranged adjacent each other for providing a visual cueing signal in accordance with a fixed program producing a sequential actuation of individual ones of the plurality of visual indicators to form a single cueing cycle spanning a predetermined period of time,

a plurality of first means individually coupled to individual ones of the visual indicators for individually controlling the actuation of the individual ones of the plurality of visual indicators,

second means coupled to the plurality of first means for controlling the individual ones of the first means in accordance with the fixed program to sequentially actuate the individual ones of plurality of visual indicators to produce sequential visual signals through the single cueing cycle spanning the predetermined period of time to serve as the visual cueing signal to a performer,

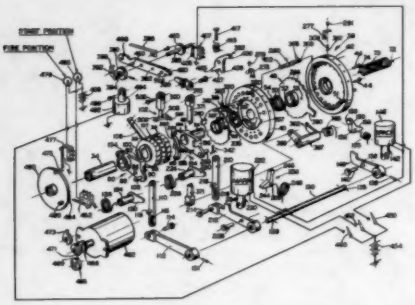
the second means controlling the individual ones of the first means in groups to produce sequential group visual signals and wherein the sequential group visual signals include alternate illumination and blinking off of groups of the visual indicators and wherein the alternate illumination and blinking off of groups of the visual indicators provides a progressive reduction of the number of visual indicators in the groups, and

third means coupled to the second means for initiating the single cueing cycle spanning the predetermined period of time by initiating the operation of the second means.

4,408,188
ELECTROMECHANICAL DECODER

Peter J. Caruso, Wayne, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 5, 1963, Ser. No. 306,792
Int. Cl.³ G08C *11/00*
U.S. Cl. 340—345 **28 Claims**

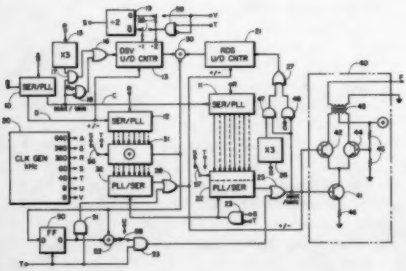


1. An electromagnetic decoder comprising a code wheel assembly including
a base member,
a shaft supported by the base member,
a first wheel element and a second wheel element carried by the shaft,
a plurality of code posts carried by the first wheel element and preset for locking the first and second wheel elements together in driving relation,
selectively operable means carried by the base member for actuating the code posts sequentially in a predetermined sense for unlocking the first and second wheel elements,
and means actuated by one of the wheel elements for performing a control function upon the first wheel element being unlocked from the second wheel element.

4,408,189
METHOD AND APPARATUS FOR CODE CONVERSION OF BINARY TO MULTILEVEL SIGNALS

Malcolm C. Betts, Sherwood Park; Alan F. Graves, Kanata; Frederick M. Pascoe, Nepean, and James E. Dilley, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 18, 1981, Ser. No. 264,281
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **6 Claims**

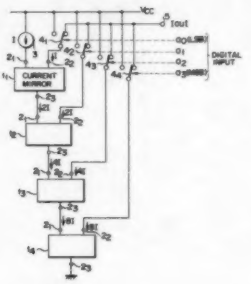


1. A code converter comprising:
means for converting blocks of binary bits into words of multilevel symbols, the words being grouped into frames;
a running digital sum counter for determining the running digital sum of all previously converted multilevel symbol words;
a digital sum variation counter for determining the digital sum variation of each word;
means responsive to the counters for inverting selected words so as to minimize the accumulated running digital sum of the previously converted multilevel symbol words, and the selected words; characterized by:
means for including a separate multilevel symbol at the end of each frame to indicate the inversion of said selected words; and
means for initializing the digital sum variation counter at the beginning of each word to a value which compensates for the digital sum variation of the separate multilevel symbol, whereby the polarity of the digital sum variation of the current word may be compared against that of the preceding running digital sum to reestablish frme synchronization.

4,408,190
RESISTORLESS DIGITAL-TO-ANALOG CONVERTER USING CASCADED CURRENT MIRROR CIRCUITS

Katsumi Nagano, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 28, 1981, Ser. No. 267,536
Claims priority, application Japan, Jun. 3, 1980, 55-74573
Int. Cl.³ H03K *13/05*
U.S. Cl. 340—347 DA **8 Claims**



1. A digital-to-analog converter for converting an input digital signal consisting of a plurality of bits into an analog quantity at an output terminal, said converter comprising:
a two-terminal constant current source having a first terminal connected to a supply voltage;
a plurality of current mirror circuits each corresponding to a different one of said plurality of bits in said input digital signal,
each of said current mirror circuits including first, second and third terminals, said first terminal receiving a current whose magnitude bears a prescribed ratio to a current at said second terminal, and said third terminal having a current whose magnitude is substantially equal to the sum of said currents at said first and second terminals,
said current mirror circuits being connected such that the third terminal of a current mirror circuit corresponding to one of said bits is connected to the first terminal of the current mirror circuit corresponding to the next most significant bit, the third terminal of the current mirror circuit corresponding to the most significant bit of said input digital signal being connected to ground and the first terminal of the current mirror circuit corresponding to the least significant bit of said digital signal being connected to a second terminal of said constant current source; and
a plurality of current switch circuits each controlled by a

different one of said plurality of bits in said input digital signal and each of said current switch circuits selectively connecting to said output terminal, in response to the state of the connected bit, the second terminal of the current mirror circuit corresponding to the controlling bit,

each of said switches including first and second transistors whose emitters are connected together to the second terminal of the corresponding current mirror circuit, the base of said first transistor being coupled to said controlling bit of said input digital signal, a collector of said first transistor being connected to said output terminal, a collector of said second transistor being connected to said supply voltage and the base of said second transistor being connected to a reference voltage.

4,408,191

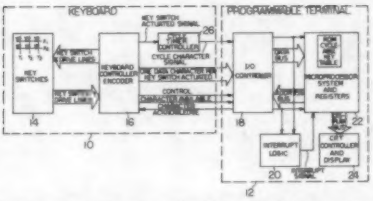
KEY CYCLE TIMER CONTROL PROVIDING A UNIVERSAL KEYBOARD

David M. Fowler, III, West Jordan, Utah, assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 102,698, Dec. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 908,346, May 22, 1978, abandoned. This application Dec. 24, 1981, Ser. No. 334,276

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 R **3 Claims**



1. A character cycle controller for a CRT display terminal, comprising:

a plurality of key switches, a separate character associated with each one of said key switches;

means responsively coupled to said plurality of key switches for generating a Key Switch Actuated signal that is indicative that one of said key switches is being depressed;

cycle timer controller means responsively coupled to said Key Switch Actuated signal for generating a Cycle Character signal only if said Key Switch Actuated signal is received for a predetermined period;

memory means for storing a plurality of addressable recycle codes, a recycle code associated with each of said key switches for indicating that the associated key switch is or is not recyclable; and,

said memory means responsively coupled to said Cycle Character signal for enabling said recycle code to recycle a recyclable character that is associated with a depressed recyclable key switch.

4,408,192

METHOD AND DEVICE FOR USE BY DISABLED PERSONS IN COMMUNICATING

Geoffrey A. Ward, Cheltenham, and Kevin E. Forward, Coburg, both of Australia

PCT No. PCT/AU80/00047, § 371 Date Apr. 8, 1981, § 102(e) Date Apr. 2, 1981, PCT Pub. No. WO81/00478, PCT Pub. Date Feb. 19, 1981

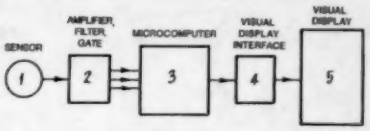
PCT Filed Aug. 8, 1980, Ser. No. 253,517

Claims priority, application Australia, Aug. 8, 1979, PD9923

Int. Cl.³ G08B *21/00*; A61B *5/10*

U.S. Cl. 340—407 **12 Claims**

1. Apparatus for use by disabled persons in communicating characters by voluntary muscle movement comprising: means for producing a first electrical signal in response to a positive voluntary muscle movement of a first character that is time indeterminate above a threshold means for producing a second electrical signal in response to a positive voluntary muscle movement of a second character that is time indeterminate above a threshold; means for producing a third electrical signal in response to a positive voluntary muscle movement of a third character that is time indeterminate above a threshold; and



translation means coupled to said signal producing means and responsive to said signals for translating said signals into an output signal adapted to produce a visual character display, said translating means utilizing a signal code in which characters are indicated by the sequential occurrence of components capable of exhibiting two different signal characteristics, said first and second signals indicating said signal code components and said third signal indicating intervals therebetween.

4,408,193

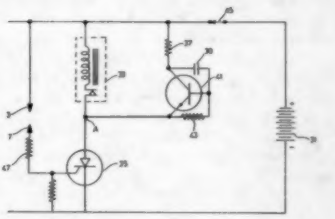
WAVE RESPONSIVE SWIMMING POOL ALARM

Theodore I. Millen, Don Mills, Canada, assignor to Georgian Manufacturing Ltd., Don Mills, Canada

Filed Jun. 8, 1981, Ser. No. 271,774

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—566 **17 Claims**



1. A device for sensing waves of predetermined magnitude in a swimming pool and the like, said device comprising a body portion and an electrical circuit provided with alert means and power source for said alert means carried by said body portion, said circuit including first electrode which, when said device is in use, is in electrical contact with the water, and a second ring electrode mounted to and extending around said body portion and positioned normally out of the water above said first electrode for closure therewith by the waves of predetermined magnitude regardless of the direction of approach of the waves, said body portion comprising an upper body section on which said ring electrode is monted and a lower buoyant body section for floating of said device, said upper body section being adjustable relative to said lower body section to adjust height setting of said ring electrode relative to the water level and sensitivity of said device, said electrical circuit normally being open to substantially eliminate all power drain from said source when said circuit is open and being provided with conductive means in said circuit which is in a conductive state to enable operation of said alert means and which is changeable to a nonconductive state for opening the circuit to deactivate said alert means and which is automatically returned to the conductive state such that said circuit is automatically reset for further activation of said alert means and including timing

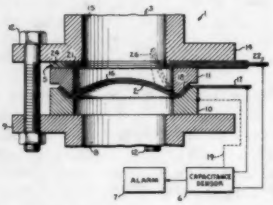
means for changing said conductive means to the nonconductive state.

4,408,194

CAPACITIVE PRESSURE RELIEF RUPTURE DISC MONITOR

Leonard K. Thompson, Independence, Mo., assignor to Continental Disc Corporation, Kansas City, Mo.

Filed Feb. 2, 1981, Ser. No. 230,662
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—626 **13 Claims**



1. In combination:

(a) a pressure relief rupture disc mounted in a pressure relief vent, said disc being electrically conductive and operative to rupture at a selected pressure differential within said vent on one side of said disc;

(b) capacitor means positioned in spaced relation to said rupture disc and forming an electrical capacitor therewith, said capacitor plate means being a loop of electrically conductive material, surrounding the interior of the vent and disposed to allow flow through said loop upon rupture of said disc, the capacitance between said rupture disc and said capacitor plate means varying in proportion to changes in the position of portions of said disc;

(c) capacitance sensor means connected to said rupture disc and said capacitor plate means and operative to sense changes in a capacitance between said rupture disc and said capacitor plate means; said sensor means providing an output signal upon a selected change in said capacitance; and

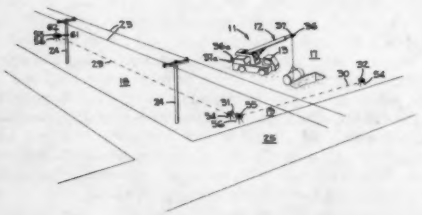
(d) alarm means connected to said capacitance sensor means and operative to trigger an indicator in response to said output signal to thereby indicate the rupture of said disc.

4,408,195

BOUNDARY PLANE WARNING SYSTEM

Barclay J. Tullis, Palo Alto; Randy J. Tan, Hayward, both of Calif., and John F. McKeon, Carmel, Ind., assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,814
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—685 **19 Claims**



1. A warning system for alerting an equipment operator that a portion of the equipment has reached the boundary of a working space, said system comprising:

an energy source for developing a curtain of energy to define the boundary of said working space;

an energy sensitive sensor mounted on an outboard portion of said equipment to provide a warning signal when said sensor reaches said energy curtain; and

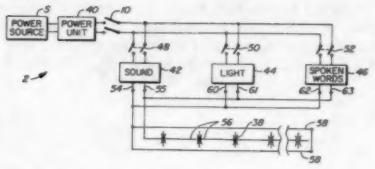
means for using said warning signal to alert said equipment operator that said equipment has reached the boundary of said working space.

4,408,196

SEISMIC ALARM SYSTEM

Albert J. Freeman, 2051 - 43rd Ave., San Francisco, Calif. 94116

Filed Apr. 6, 1981, Ser. No. 251,585
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—690 **17 Claims**



1. A seismic alarm comprising:

a plurality of motion sensors, each said sensor comprising:

a weight;

a housing for movably maintaining said weight within said housing parallel to an internal dimension, said weight including a depending positioning tab and said housing including a slot through which said tab extends to allow said weight to be positioned along said internal dimension; and

electric contacts operable by said weights being displaced from a central position along said internal dimension;

means for adjustably mounting said motion sensors in a generally horizontal plane, said motion sensors being positioned at various angles to one another;

a warning device electrically coupled to said electric contacts; and

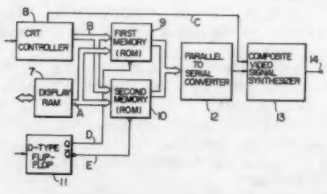
means for powering said warning device for indicating when one or more of said weights have been displaced from said central position as a result of a seismic event.

4,408,197

PATTERN DISPLAY APPARATUS

Shigeru Komatsu, Yokohama; Kunihiko Nagai, Zushi; Takuo Koyama, Yokohama; Tsuguji Tachiuchi, Yokohama, and Shigeru Hirahata, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 30, 1981, Ser. No. 259,162
Claims priority, application Japan, May 8, 1980, 55-59891
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—720 **7 Claims**



1. A display apparatus for use with a cathode-ray tube capa-

ble of displaying patterns in interlaced scanning and non-interlaced scanning operation modes, comprising:

means for synthesizing a signal to be supplied to said cathode-ray tube:

means for storing data representative of patterns to be displayed;

means for setting said storing means for one of said two operation modes, depending upon the complexity of patterns to be displayed;

means for generating a data selection signal for reading pattern data in said storing means in accordance with information to be displayed and supplying the pattern data which has been read to said signal synthesizing means for synthesizing a signal carrying said information to be displayed; and

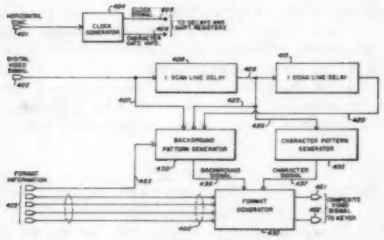
means for generating a raster line number signal indicative of a scanning line being produced on said cathode-ray tube, said data selection signal and said raster line number signal serving in combination as an access signal to said storing means during said data reading operation.

4,408,198

VIDEO CHARACTER GENERATOR

Paul E. Kudirka, Acton, Mass., assignor to Shintron Company, Inc., Cambridge, Mass.

Filed Sep. 14, 1981, Ser. No. 302,160
Int. Cl.³ G09G 1/16
U.S. Cl. 340—729 **10 Claims**



1. In display enhancement apparatus for use in a video display system having circuitry for producing digital signals having first and second values representative of a video character, said apparatus having at least one delay means for generating delayed signals which are equivalent to said signals delayed by a time interval equal to the time duration of one horizontal scan line and a clock signal generator for generating clocking signals in synchronism with said digital signals, the improvement comprising,

gate means responsive to said digital signals and said delayed signals comprising said character for producing an output when said signals have said first value,

a parallel-loading shift register responsive to said output for loading a predetermined pattern of digital information into each stage of said register, and responsive to said clocking signals for shifting said predetermined pattern through said register stages, and

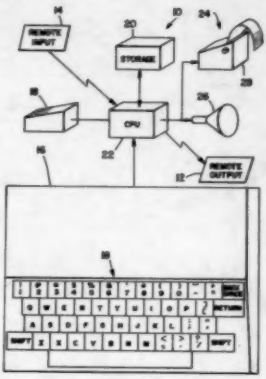
means responsive to the digital information stored in one of said shift register stages for generating a background signal output.

4,408,199

IDEOGRAM GENERATOR

Douglass A. White; Susan J. Moore, and David F. Clark, all of Fairfield, Iowa, assignors to Global Integration Technologies, Inc., Fairfield, Iowa

Filed Sep. 12, 1980, Ser. No. 186,580
Int. Cl.³ G09G 1/16
U.S. Cl. 340—731 **21 Claims**



1. In a computer display system including input means for receiving coded sequences of signals, processor means for storing a control program, output means responsive to said control program and said coded sequence of said signals for displaying two-dimensional shapes, storage means for hierarchically storing a set of ideograms, and means responsive to one of said coded sequences for controlling said storage means to provide to the said output means for display thereon one of said ideograms in a predetermined space; the improvement comprising:

reduction means responsive to said control program for selectively reducing at least one dimension of at least one of said ideograms by selecting pixels in said one ideogram which may be omitted while retaining the intelligence associated with the ideogram;

position means responsive to said control program for placing said one reduced ideogram adjacent a second ideogram for simultaneous display on said output means in the same predetermined space.

4,408,200

APPARATUS AND METHOD FOR READING AND WRITING TEXT CHARACTERS IN A GRAPHICS DISPLAY

David J. Bradley, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1981, Ser. No. 292,084
Int. Cl.³ G09G 1/02
U.S. Cl. 340—747 **9 Claims**

1. A raster scan video display control apparatus of the type including a graphic video display refresh buffer operable in an all points addressable mode for refreshing said display with graphics data, a processor for writing graphic data into said display refresh buffer, and a character storage for storing the character dot patterns of a display character font, characterized by:

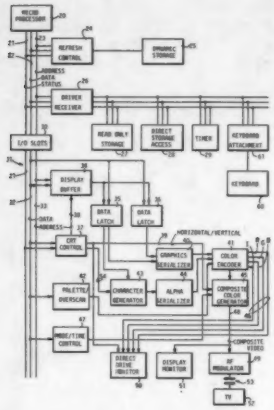
means for selecting a character to be displayed; and

programmable control means referenced by said processor for

(1) loading from said storage into said graphic video display refresh buffer a character dot pattern corresponding to the character to be displayed;

(2) expanding the selected character dot pattern into a

predetermined pixel format and then color encoding the expanded dot pattern to establish a resultant expanded-/encoded dot pattern; and



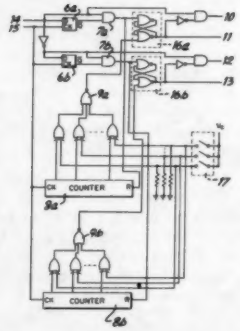
(3) loading said expanded/encoded dot pattern into said graphic video display refresh buffer.

4,408,201

ELECTRO-OPTIC DISPLAY DEVICE USING PHASE TRANSITION MODE LIQUID CRYSTAL

Takamasa Harada, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 19, 1980, Ser. No. 218,183
Claims priority, application Japan, Dec. 25, 1979, 54/168644
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—784 **5 Claims**



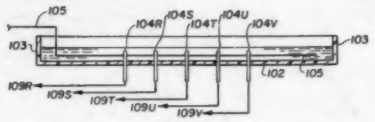
1. In a display device having a phase transition mode liquid crystal sandwiched between display electrodes and a common electrode, and a driving circuit for driving the phase transition mode liquid crystal, the improvement comprising: said driving circuit including means for generating and applying to the display and common electrodes two square voltage waves, one of which has an effective voltage to place said liquid crystal in a homeotropic state and a first predetermined interval of zero volts level between successive waves, the other of which has an effective voltage to place said liquid crystal in a focal-conic state and a second predetermined interval of zero volts level between successive waves, the effective voltages of the two square voltage waves being dependent on the first and second predetermined intervals of zero volts level and the first and second predetermined intervals of zero volts level being determined independently of one another.

4,408,202

ELECTROKINETIC DISPLAY SYSTEM

John D. Fales, 5 Maria Ct., Huntington Station, N.Y. 11746

Continuation-in-part of Ser. No. 93,849, Nov. 13, 1979, abandoned. This application Dec. 2, 1981, Ser. No. 326,554
Int. Cl.³ G09G *3/16*
U.S. Cl. 340—785 **70 Claims**



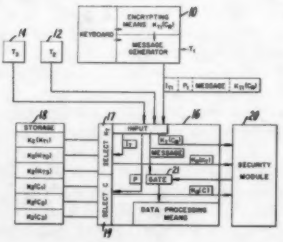
1. A method for displaying chemical concentrations and gradients associated therewith, comprising forming in an electrochemical cell a starting electrolyte which contains at least one reagent which during electrolysis forms reaction product species that react chemically substantially reversibly, said electrochemical cell having at least two spaced electrodes extending in and defining a current path in said electrolyte and having a wall at least part of which is transparent and a second wall extending in spaced relation along opposite sides of said current path, the distance between said walls across said path being no greater than about three inches and between said electrodes being such that the ratio of the interelectrode distance to the interwall distance is at least about 5 to 1, said electrolyte during electrolysis containing electrolysis reaction-product species movable along said path in the space between the cell electrodes, said reagent being selected from the group consisting of (a) self-indicating reagents the reaction products of which provide one or more indications of the chemical concentration thereof, (b) reagents which include an indicator reagent that provides one or more indications of the presence of electrolysis reaction products, and (c) mixtures of (a) and (b), and passing at least enough current in one direction between the cell electrodes to establish at least one flow of electrolysis reaction-products in said electrolyte along said path between said electrodes visible through the transparent wall and accompanied by a chemical concentration gradient.

4,408,203

SECURITY SYSTEM FOR ELECTRONIC FUNDS TRANSFER SYSTEM

Carl M. Campbell, Newtown Square, Pa., assignor to MasterCard International, Inc., New York, N.Y.

Division of Ser. No. 867,924, Jan. 9, 1978, Pat. No. 4,259,720. This application Nov. 10, 1980, Ser. No. 205,295
Int. Cl.³ H04Q *9/00*; H04L *9/00*; G06F *15/30*; G06K *5/00*
U.S. Cl. 340—825.34 **8 Claims**



1. In a system having a data processing unit and at least one transaction terminal, for automatically processing data entered

at said terminal by an authorized person, apparatus for verifying the identity of said authorized person, comprising:

manual code entry means at said terminal, for receiving a secret code entered by said person and for generating first electrical signals representative of said code;

encrypting means at said terminal, associated with said manual code entry means, and responsive to said first electrical signals and a first encrypting key, for generating second electrical signals representative of said secret code encrypted by said first key;

means at said terminal for receiving identifying information other than said secret code, and for generating third electrical signals representative of said identifying information;

storage means, associated with said data processing unit for storing a plurality of signals representative of a plurality of said secret codes, each encrypted by a second encrypting key, said storage means including means responsive to said third electrical signals for selecting one of said encrypted stored codes;

a security module, separate from said data processing unit and in communication therewith, responsive to said second electrical signals and said selected encrypted stored code, for decrypting said second electrical signals and said selected encrypted stored code and for providing an output indication to said data processing unit if said second electrical signals are representative of said selected stored code, said security module being operationally arranged to prevent output of said code in decrypted form;

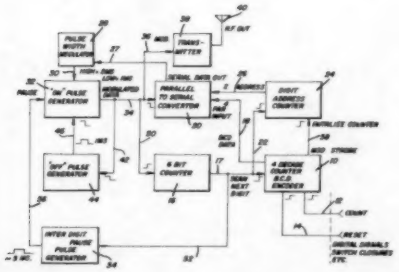
and system enabling means, associated with said data processing unit, and responsive to said output indication for allowing the automatic processing of data entered by said person at said terminal.

4,408,204

DIGITAL COUNTER/TRANSMITTER WITH REMOTE RECEIVER/DISPLAY

Richard S. Salvesen, Hampton, Iowa, assignor to Midwest Computer Register Corp., Hampton, Iowa

Filed Aug. 6, 1980, Ser. No. 175,857
Int. Cl.³ G08C *19/16*
U.S. Cl. 340—870.24 **16 Claims**



1. An asynchronous system for remotely monitoring a counted total and locally displaying that total, said system comprising:

counter means for receiving input pulses and maintaining a stored count of said received pulses as data in counter elements;

scanning means for sequentially accessing data in each element of said counter means;

address counter means for assigning an address to data from each said element indicative of the position of the element containing the addressed data relative to the other elements in said counter means;

pulse width modulator means for receiving data from each element of said counter means when accessed by said scanning means and the assigned address and pulse width modulating said data and assigned address;

transmitter means for receiving said pulse width modulated data and assigned address and transmitting pulses in response thereto;

receiving means for receiving said pulses;

discriminator means for converting said pulses into discrete amplitude signals indicative of said data and assigned addresses; and

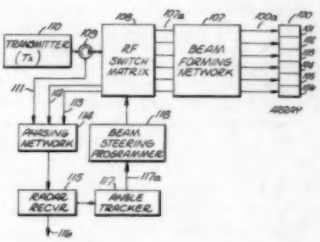
display and control means for displaying said discrete amplitude signals indicative of said data in accordance with the assigned address.

4,408,205

MULTIPLE BEAM ANTENNA FEED ARRANGEMENT FOR GENERATING AN ARBITRARY NUMBER OF INDEPENDENT STEERABLE NULLS

George A. Hockham, Haslemere, England, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,149
Int. Cl.³ G01S *13/00*; H04B *15/00*
U.S. Cl. 343—16 R **12 Claims**



1. A directive antenna and feed system for providing a main beam pattern at a first predetermined angle and an arbitrary number of pattern nulls each at a corresponding angle with respect to said main beam predetermined angle, comprising:

a plurality of independent antenna elements deployed in an array;

a reciprocal beam-forming network having a plurality of first ports and a plurality of second ports, each of said second ports being discretely connected to a corresponding one of said independent antenna elements, said network providing excitation of said array so as to form a main beam at a different angle for each of said first ports excited;

duplexing means having transmitter, receiver and antenna ports and connected at its antenna port to a selected one of said beam-forming network first ports corresponding to a predetermined angle of said main beam for conducting transmitted energy to said selected first port; and

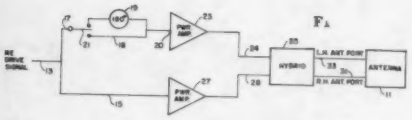
a phasing network connected to receive incoming signal energy through said duplexing means from said selected beam-forming network first port and directly from at least one other of said first ports on separate terminals of said phasing network, said phasing network having an output terminal for receiver connection and also including means for controllably phasing said incoming signal energy to provide a null at an angle of array reception corresponding to each of said other first ports.

4,408,206

SYSTEM FOR TRANSMITTING POWER FROM A SOLAR SATELLITE TO EARTH AND SUBSEQUENT CONVERSION TO A 60 HERTZ THREE PHASE SIGNAL

John L. Fitch, Seattle, and Donald B. Spencer, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 21, 1979, Ser. No. 106,099
Int. Cl.[3] H04B 7/00
U.S. Cl. 343—352 18 Claims



1. A system for transmission of power which is in the form of continuous-wave microwave-frequency electrical signal energy, comprising:

first antenna means configured and arranged to transmit the microwave signal with a given polarization;

means for driving said first antenna means with a microwave signal in such a manner that the polarization of the transmitted microwave signal changes regularly with time throughout the transmission of the microwave signal, in a predetermined manner, at a selected rate which is substantially less than the frequency of the microwave signal;

second antenna means for receiving the transmitted microwave signal;

means associated with said second antenna means for recovering the power in the transmitted microwave signal received by said second antenna means; and

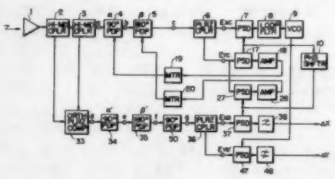
means responsive to said recovering means for converting the recovered microwave signal into a three phase signal at a power frequency, the resulting signal being suitable for use as a power signal.

4,408,207

ANGULAR ERROR DETECTING DEVICE

Yoshihiko Yoshikawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,294
Int. Cl.[3] H04B 7/00
U.S. Cl. 343—362 7 Claims



1. An angular error detecting device in which reference signals are obtained from fundamental mode components in a waveguide which have passed a first set of at least one 180° phase difference plate and one 90° phase difference plate, phase lag surfaces of which are disposed so that a polarization loss of a unit adapted to receive waves from a target is minimized, angular error signals are obtained utilizing two higher mode components which are in orthogonal relation, and said angular error signals are subjected to synchronous detection by a local oscillator output synchronous with said reference signals thereby to detect two orthogonal angular errors, the improvement wherein a circuit for obtaining said angular error signals comprises:

at least higher mode detector means for obtaining said two higher mode components which are in orthogonal relation;

a circuit for combining said two higher mode components in such a manner that said two higher mode components are in orthogonal relation;

a circuit having a second set of at least one 90° phase difference plate and one 180° phase difference plate which have rotatable phase lag surfaces and are cascade-connected, said 90° phase difference plate in said second set being provided on the side of said circuit for combining said two higher order components, said phase lag surface of said 90° phase difference plate in said second set being disposed in an angular ratio of 2:1 with respect to said phase lag surface of said 180° phase difference plate in said first set, and said phase lag surface of said 180° phase difference plate in said second set being disposed in an angular ratio of 1:1 with respect to said phase lag surface of said 180° phase difference plate in said first set;

means for dividing an output of said 180° phase difference plate in said second set into first and second polarization components which are orthogonal to each other;

means for synchronously detecting said first-polarization component with said local oscillator output synchronous with said reference signals to provide a first angular error output; and

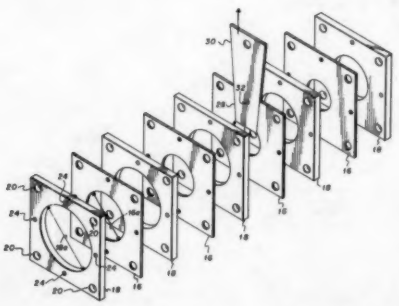
means for synchronously detecting said second polarization component with a signal different by 90° in phase from that in providing said first angular error output so as to provide a second angular error output which is orthogonal to said first angular error output.

4,408,208

DIP BRAZED CORRUGATED FEED HORN

Theodore A. Dumas, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 23, 1981, Ser. No. 246,520
Int. Cl.[3] H01Q 13/02
U.S. Cl. 343—786 10 Claims



1. A method for making a corrugated feed horn for an antenna, comprising:

dip brazing a plurality of laminations providing alternate fins and grooves including controlling a braze metal to creep along the interfaces between the laminations, while preventing buildup of the metal in the grooves, said brazing including

providing aligned apertures in said laminations;

running braze metal wire through said aligned apertures; and

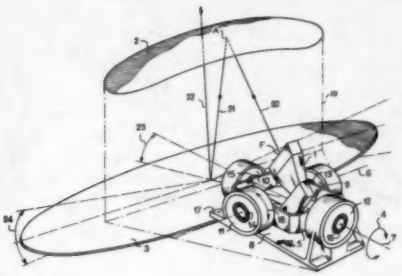
melting said wire by dipping said laminations in a solution heated above the melting point of the wire but below the melting point of the laminations.

4,408,209

ORIENTABLE BEAM ANTENNA FOR TELECOMMUNICATIONS SATELLITE

Jacques Urien, and Bruno Vidal Sainte Andre, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 23, 1980, Ser. No. 220,156
Claims priority, application France, Dec. 27, 1979, 79 31803
Int. Cl.³ H01Q 1/50
U.S. Cl. 343—861 **5 Claims**



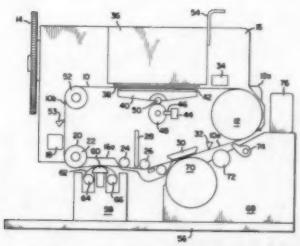
1. In an orientable beam antenna comprising a fixed primary source on board a satellite operable in spatial vacuum: a first reflector mechanically integral with the primary source and receiving the radiation emitted by the primary source, and a second orientable reflector receiving the waves reflected by the first reflector, the primary source being offset so as not to intercept the waves reflected by the first reflector, and a kinematic system mechanically coupling the second reflector at its periphery to the primary source.

4,408,210

PAPER FEED AND FUSING ASSEMBLY FOR MAGNETOGRAPHIC PRINTING APPARATUS

Ronald J. Cieplik, Mountain Lakes, N.J., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 12, 1981, Ser. No. 292,092
Int. Cl.³ G01D 15/12
U.S. Cl. 346—74.2 **14 Claims**



1. Apparatus for magnetographic recording and production of a permanent visual image on an image recording medium, comprising:

(a) first means responsive to electrical information signals for producing a preliminary visual image on said image recording medium, said first means including

(1) first support means supporting first components including:

(1a) a magnetizable recording medium on which said visual images are recorded responsive to said signals and are then made visual by developing them with toner,

(1b) means for advancing said magnetizable recording medium, and

(1c) means for transferring a toner-developed image from said magnetizable recording medium to said image recording medium,

and said first support means is movable to collectively move said first components between a first position wherein said first components cooperate to produce the permanent visual image on the image recording medium and a second position wherein said first components may be accessed, and

(2) second support means and fixedly supporting second components of said first means for registration with selected ones of said first components upon such movement of said first support means from such second position into said first position thereof; and

(b) second means for receiving said image recording medium from said first means for receiving said image recording medium from said first means and rendering said preliminary visual image permanent,

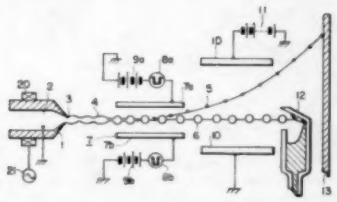
said first support means and said second support means defining respective first and second channels therein for passage of said image recording medium, said first and second channels being selectively registered upon said movement of said first support means from said second position to said first position thereof to provide a composite channel for movement of said image recording medium through said apparatus.

4,408,211

INK-JET RECORDING DEVICE FEATURING SEPARATING OF LARGE AND SMALL DROPLETS

Takahiro Yamada, Tokai, Japan, assignor to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Mar. 26, 1981, Ser. No. 247,738
Claims priority, application Japan, Mar. 26, 1980, 55/37429
Int. Cl.³ G01D 15/18
U.S. Cl. 346—75 **14 Claims**



1. An ink-jet recording device comprising:

a nozzle which is supplied with ink pressurized to a predetermined pressure and which spouts an ink column from a nozzle hole thereof,

vibration applying means to apply mechanical vibrations of predetermined magnitude to said nozzle so as to separate a larger ink droplet and a smaller ink droplet from said ink column alternately and successively and to cause them to fly,

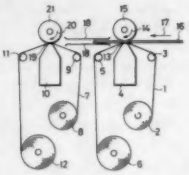
charging and deflecting means arranged in a manner to hold therein a part of said ink column in which said ink droplets separate and fly from said ink column, said charging and deflecting means charging the smaller one of said ink droplets in response to a recording signal applied to said charging and deflecting means and deflecting the charged ink droplets in correspondence with a quantity of static charges thereon immediately after the separation of said ink droplets from said ink column.

4,408,212

MULTI-COLOR RECORDING DEVICE

Fujio Moriguchi, and Masami Kurata, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,692
Claims priority, application Japan, Feb. 5, 1981, 56-15042
Int. Cl.³ G01G *15/10*
U.S. Cl. 346—76 PH **4 Claims**



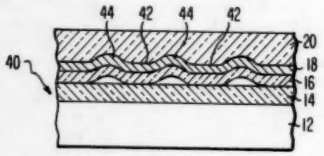
1. In a multi-color recording device of the type including at least first and second recording stations each including first and second thermal heads, respectively, and a rotatable pressure means for urging a recording paper sheet against said thermal head and for forwarding said recording paper sheet through said recording device, the improvement characterized in that said pressure means comprises a band-like member extending from said first to said second recording stations.

4,408,213

REINFORCED BUBBLE RECORDING MEDIUM AND INFORMATION RECORD

Alan E. Bell, Hampton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1981, Ser. No. 316,916
Int. Cl.³ G01D *15/34*
U.S. Cl. 346—135.1 **13 Claims**



1. An optical recording medium comprising
a substrate;
a spacer layer overlying a surface of the substrate;
a substantially transparent reinforcement layer overlying the spacer layer; and
a light absorptive layer overlying the spacer layer;
wherein the spacer layer melts, sublimes or decomposes at a temperature less than the melting temperature of the light absorptive layer and wherein the reinforcement layer does not melt, sublime or decompose at a temperature less than the melting temperature of the light absorptive layer and preferentially adheres to the light absorptive layer.

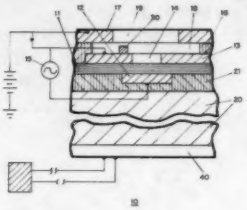
4,408,214

THERMALLY REGULATED ION GENERATION

Richard A. Fotland, Holliston, and Leo A. Beaudet, Milford, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Aug. 24, 1981, Ser. No. 295,941
Int. Cl.³ G01D *15/06*; H01J *7/24*; H05B *31/26*
U.S. Cl. 346—159 **20 Claims**

7. Improved apparatus for generating ions comprising a glow discharge device of the type including a solid dielectric member; a plurality of electrodes separated by the solid dielectric member, with an air region adjacent the junction of at least one of the electrodes and the solid dielectric member; and means for applying a time-varying potential between the electrodes to generate ions in the air region;



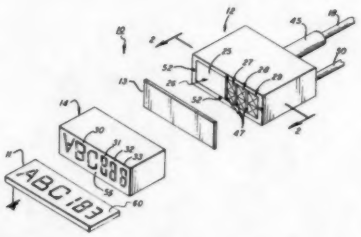
wherein the improvement comprises means for heating the glow discharge device to an elevated temperature above the intrinsic operating temperature of said device.

4,408,215

ELECTROCHEMICAL MARKING APPARATUS

William D. Kitchen, Utica, N.Y., assignor to Electromark, division of Mohawk International Inc., Utica, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,844
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—165 **10 Claims**

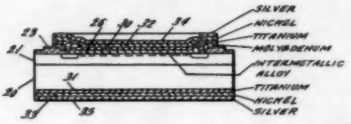


1. Apparatus for electrochemically marking a grounded conductive part that includes
a dielectric stencil having a front face for being positioned adjacent to a grounded conductive part and further includes a series of slotted openings passing therethrough to create at least one seven bit character generating format,
an electroded head positioned behind the stencil having an electrically isolated elongated electrode overlying each of the slotted openings in the stencil,
electrical means for independently firing each of the electrodes whereby a preselected character is electrically imaged upon the surface of said part, and
wicking means positioned between the electroded head and said part for wetting the part with an electrolyte for developing the electrical image recorded on the part.

4,408,216
SCHOTTKY DEVICE AND METHOD OF MANUFACTURE USING PALLADIUM AND PLATINUM INTERMETALLIC ALLOYS AND TITANIUM BARRIER FOR LOW REVERSE LEAKAGE OVER WIDE TEMPERATURE RANGE

Herbert J. Gould, Howthorn, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Continuation of Ser. No. 104,102, Dec. 17, 1979, abandoned, which is a division of Ser. No. 911,764, Jun. 2, 1978, Pat. No. 4,206,540. This application Jun. 28, 1982, Ser. No. 393,029
Int. Cl.³ H01L 29/48
U.S. Cl. 357—15 11 Claims

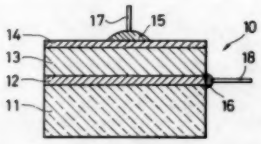


1. A schottky diode comprising a single crystal epitaxial silicon semiconductor substrate; means for reducing the reverse bias leakage current over a wide temperature range across the entire schottky junction interface of said schottky diode, said means including a layer of metal-diffused silicon on one surface of said substrate; said layer being produced by first sintering a first metal into said one surface and then removing all traces of said first metal and its silicides; and a second metal in surface-to-surface contact with said layer to form said schottky junction interface with said layer; said second metal having a work function which is about that of high work function metals such as molybdenum and platinum; said first metal being selected from the group consisting of palladium and platinum; said first metal being different from said second metal.

4,408,217
GAN ELECTROLUMINESCENT SEMICONDUCTOR DEVICE AND METHOD FOR MAKING THE SAME

Hiroyuki Kobayashi; Yoshimasa Ohki, both of Sagamihara; Yukio Toyoda, Tokyo, and Isamu Akasaki, Machida, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Dec. 4, 1980, Ser. No. 213,599
Claims priority, application Japan, Dec. 5, 1979, 54-158664
Int. Cl.³ H01L 33/00
U.S. Cl. 357—17 5 Claims

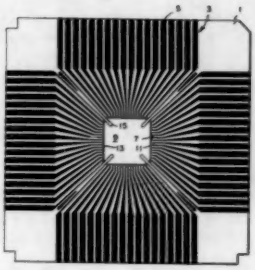


1. An electroluminescent semiconductor device comprising:
a substrate;
a multilayered structure of crystalline gallium nitride having an undoped conductive region with a high concentration of donors to make it conductive on said substrate, an undoped resistive region continued from said undoped conductive region as a homogeneous structure and an insulative region on said resistive region and doped with acceptor impurities to make it insulative; and
a pair of first and second electrodes, said first electrode being formed on said insulative region.

4,408,218
CERAMIC CHIP CARRIER WITH LEAD FRAME HAVING REMOVABLE RIM

Dimitry G. Grabbe, Lisbon Falls, Me., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 27, 1981, Ser. No. 248,605
Int. Cl.³ H01L 23/48
U.S. Cl. 357—70 2 Claims

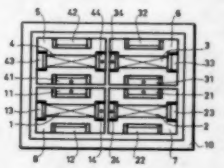


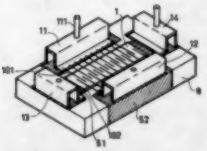
1. A semiconductor chip carrier of the type comprising a ceramic substrate with a metallic lead frame attached thereto, said lead frame comprising a plurality of leads having outer portions which extend to the edge of said substrate and tip portions proximate to the interior region of said substrate, said tip portions having integral support means attached thereto, characterized in that said lead frame is bonded directly to said substrate, said support means comprising a common rim overlying said interior region of said substrate and spaced therefrom, said rim having extended portions which connect adjacent tip portions which are substantially non-parallel, said extended portions having a length greater than the shortest straight line distance between said adjacent non-parallel tip portions, said rim being bent to a non-coplanar relationship to the rest of said lead frame.

4,408,219
DEVICE FOR CONNECTING IN PARALLEL POWER TRANSISTORS IN VERY HIGH FREQUENCY

Jean C. Resneau; Marius Cirio, and Jean Doyen, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 18, 1980, Ser. No. 208,006
Claims priority, application France, Nov. 21, 1979, 79 28692
Int. Cl.³ H01L 39/02
U.S. Cl. 357—80 6 Claims





1. A device for connecting in parallel 2n transistor chips (1,

2, 3, 4) for operating at high power and very high frequency, said device comprising:

a lower thermally and electrically conducting plate (10),

2n wafers (5, 6, 7, 8) electrically insulating and thermally conductive, welded to said conducting plate (10), arranged in n columns, and on each of which one of said 2n chips is placed,

an upper electrically insulating plate (15) supporting two metallized zones (60, 70) on its outer face, said insulating plate facing said conducting plate, and

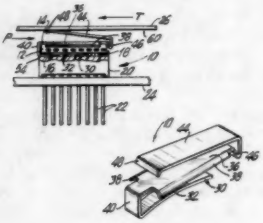
wherein each wafer is provided with at least three terminals (11, 12, 13, 14) respectively connected with each electrode of said one of said 2n transistor chips, one of said terminals (12) being connected with said conducting plate and two of said terminals (11, 14) supporting conducting projections (111) traversing said upper insulating plate and each of said two terminals respectively contacting one of said metallized zones (60, 70).

4,408,220

HEAT DISSIPATOR FOR A DUAL IN LINE INTEGRATED CIRCUIT PACKAGE

Anthony D. Calabro, 8738 W. Chester Pike, Upper Darby, Pa. 19082

Filed Jan. 29, 1981, Ser. No. 229,449
Int. Cl.³ H01L *23/02, 23/48, 29/44*
U.S. Cl. 357—81 **8 Claims**



1. A heat dissipator for a dual in line integrated circuit package, said package having a longitudinally extending, generally rectangular housing with opposed top and bottom walls, opposed pairs of side and end walls, and a plurality of downwardly extending leads disposed in two longitudinally extending rows adjacent said side walls, said heat dissipator comprising:

a longitudinally extending bottom contact plate, the width of said bottom contact plate being less than the distance between said rows of leads;

a longitudinally extending top contact plate disposed in spaced relationship to said bottom contact plate, the width of said top contact plate substantially equalling the width of said integrated circuit package, said top contact plate including a pair of longitudinally aligned rails extending angularly downward from the side edges thereof;

an intermediate segment extending between and connecting one end of each of said contact plates; and

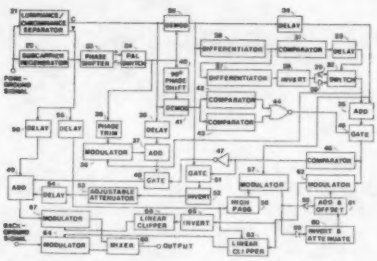
a radiator plate extending from the opposed remaining end of said top contact plate, and a downwardly projecting locking flange being interconnected between said top contact and radiator plates, said heat dissipator being unitary in construction, and formed from a resilient material whereby said heat dissipator can be slidably mounted on said integrated circuit package with said bottom contact plate being in contact with said bottom wall intermediate said rows of leads, and with said top contact plate being in coplanar and contiguous relationship with said top wall, with the rails thereof gripping the side edges of said top wall and the downwardly projecting locking flange engaging one end of said integrated circuit package, the rails and the locking flange stabilizing said heat dissipator on said integrated circuit package, such that the heat generated by said integrated circuit package during use is conducted by said top and bottom contact plates to said radiator plate for dissipating said heat and reducing the operating temperature of said integrated circuit package.

4,408,221

TELEVISION CHROMA-KEY SYSTEMS

Reginald F. H. McCoy, Gainesville, Fla.

Filed Sep. 22, 1981, Ser. No. 304,588
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—22 **17 Claims**



1. Apparatus for combining a signal, including a color subcarrier, representing a first television image and a signal representing a second television image to produce a signal representing a combined image having the picture content of said first television image except in those areas of said first television image having a chosen color, the picture content of said combined image in said areas of said chosen color being the picture content of said second television image, whereby objects in said first television image of colors other than said chosen color will appear in said combined image to be in front of said second television image; incorporating a means of determination of the occurrence of said chosen color and preventing undesired response to other colors, comprising:

a. First means for providing an output responsive to the amplitude and phase of said color subcarrier, said first means responding preferentially to said subcarrier when having a phase corresponding to the phase resulting from the presence of said chosen color in said first television image,

b. Second means for providing an output responsive to the amplitude and phase of said subcarrier responding preferentially when said phase of said subcarrier differs from that phase to which said first means responds preferentially,

c. Means responsive to the amplitude of the output of said second means causing a first inhibit signal to be present whenever said output of said second means exceeds a first chosen value of one polarity and causing a second inhibit signal to be present whenever said output of said second means exceeds a second chosen value having opposite polarity to said first chosen value,

d. Control means whereby the output of said first means responsive to the amplitude and phase of said subcarrier controls the combination of said first television image and said second television image, to form said combined image, and

e. Means for the application of said first and second inhibit signals to said control means, the presence of said first inhibit signal inhibiting said control means from including said second television image in said combined image, and likewise, the presence of said second inhibit signal inhibiting said control means from including said second television image in said combined image, whereby the range of colors in said first television image causing said control

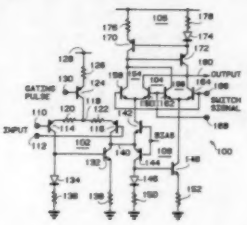
means to include said second television image may be constrained.

4,408,222

PHASE DETECTOR FOR TELEVISION TUNING SYSTEMS AND THE LIKE

Michael J. Gay, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1980, Ser. No. 148,348
Int. Cl.³ H04N *5/44*
U.S. Cl. 358—24 **15 Claims**



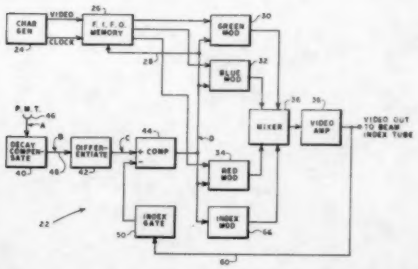
11. In a PAL/SECAM television receiver system having a chroma demodulator section including a frequency discriminator for producing output pulses the sense of which alternate in accordance with the particular television line sequence, a phase detector coupled with the frequency discriminator for identifying the line sequence, the phase detector including a differential amplifier input stage having differential inputs which are adapted for receiving the outputs from the frequency discriminator, a multiplier section having control input terminals adapted to receive switching signals at half the line sequence frequency and a current mirror circuit coupled to outputs of the multiplier section for providing an output signal the sense of which is determined by the phase relationship between the output signals from the frequency discriminator and the switching signals, the improvement comprising a rectifier section that is coupled between the output of the differential amplifier section of the phase detector and inputs of the multiplier section for preserving the sense of any error current components produced by the differential amplifier which are coupled to the multiplier section to substantially eliminate said error currents.

4,408,223

BEAM INDEX COLOR DISPLAY SYSTEM

Richard W. Midland, Inverness, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 5, 1981, Ser. No. 270,944
Int. Cl.³ H04N *9/22, 9/24*
U.S. Cl. 358—67 **11 Claims**



1. In a system having a character generator and a beam index tube which generates a periodic index signal as the tube's beam strikes index stripes within the tube, said character generator being activated to generate data independently of the index tube, a display system for driving the tube with data received from the character generator comprising:

means responsive to the index signal for generating an index clock signal;

a memory coupled to the character generator for storing data received from the character generator and for outputting the stored data in response to the index clock signal; and

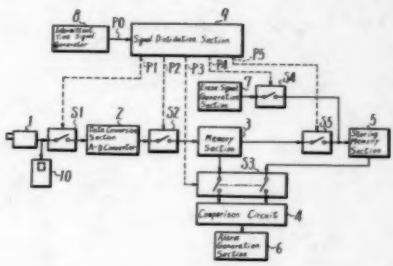
output means receiving the data output of the memory and responsive to the index clock signal for outputting the data in a given sequence for application to the beam index tube.

4,408,224

SURVEILLANCE METHOD AND APPARATUS

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,653
Claims priority, application Japan, May 9, 1980, 55-61597
Int. Cl.³ H04M *7/18*
U.S. Cl. 358—108 **3 Claims**



1. A place scenery surveillance apparatus comprising:

(a) a video camera picking up a place scenery to be surveyed and producing a video signal;

(b) a data conversion means for converting the video signal responding to the place scenery from said video camera into data signal;

(c) a first memory means for memorizing said data signal from said data conversion means as a current data signal;

(d) a second memory means for memorizing a data signal from said first memory means as a previous data signal provided during a previous surveillance;

(e) a comparison means for comparing said current data signal stored in said first memory means with said previous data signal stored in said second memory means;

(f) an erasing means for erasing the previous data signal memorized in said second memory means;

(g) first, second and third switching means which are respectively inserted between said first and second memory means and said comparison means, said erasing means and said second memory means as well as between said first memory means and said second memory means;

(h) a control means for controlling ON and OFF of said first, second and third switching means in time sharing manner such that said first switching means is made ON at first to supply said current data signal and previous data signal to said comparison means, after said comparison being finished said second switching means being made ON to erase said previous data signal memorized in said second memory means, and then said third switching means being made ON to supply said current data signal to said second memory means to be memorized as a new previous data signal for next surveillance; and

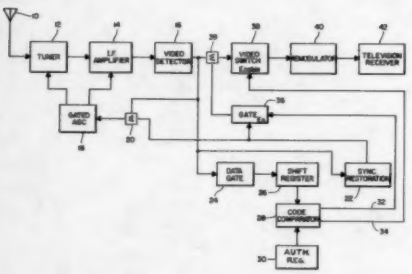
(i) an alarm generating means for generating an alarm upon receiving an output that is generated by said comparison means.

4,408,225

SUBSCRIPTION TELEVISION DECODER

James W. Ensinger, Roselle, and Melvin C. Hendrickson, Elmhurst, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 6, 1981, Ser. No. 280,722
Int. Cl.³ H04N 7/16
U.S. Cl. 358—120 **5 Claims**



1. A decoder for unscrambling a broadcast RF television signal used to transmit one or more levels of programming information, said television signal being characterized by randomly suppressed horizontal blanking and synchronization pulses and including a program code identifying the level of programming information currently being transmitted, said decoder comprising:

means for receiving and converting said broadcast RF television signal to a corresponding baseband video signal, said receiving and converting means including a gated automatic gain control circuit operable in response to the horizontal synchronization pulses of a standard television signal;

means storing a subscriber authorization code identifying one or more of said levels of programming information;

means for developing a decode authorization signal in response to the detection of a predetermined relationship between said stored subscriber authorization code and the program code characterizing said transmitted television signal;

means developing a standard horizontal synchronization pulse in response to each suppressed horizontal blanking pulse of said baseband video signal; and

first circuit means for combining said baseband video signal with said standard horizontal synchronization pulses for continuously operating said gated automatic gain control circuit;

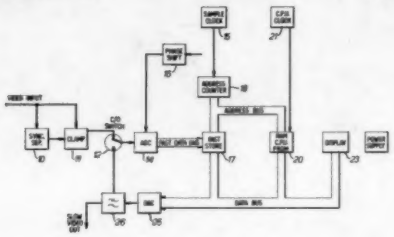
second circuit means operable independently of the first circuit means for combining said baseband video signal with said standard horizontal synchronization pulses for unscrambling said baseband video signal only in response to the development of said decode authorization signal.

4,408,226

TEST APPARATUS FOR MONITORING DIGITAL TRANSMISSIONS

Andrew Dean, Winnall, and Peter R. Hutt, Petersfield, both of England, assignors to Independent Broadcasting Authority, London, England

Filed Jan. 9, 1981, Ser. No. 223,830
Claims priority, application United Kingdom, Jan. 11, 1980, 8001036
Int. Cl.³ H04N 5/13
U.S. Cl. 358—139 **6 Claims**



1. Apparatus for monitoring a digital waveform contained in a broad band television video signal, comprising

(a) sampling means (**14, 15**) for sampling the digital waveform at first locations and at an integer multiple of the digital bit rate which is above the Nyguist level to produce output digital words indicative of the samples;

(b) temporary storage means (**17**) for storing said output digital words;

(c) analyzing means including a microprocessor (**20**) for producing from the output digital words stored in said storage means a value of a given parameter of the digital waveform;

(d) display means (**23**) for displaying said value;

(e) conversion means (**25, 26**) connected with said temporary storage means for producing from the stored output digital words a recreated digital waveform; and

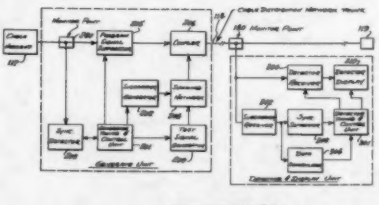
(f) control means (**16**) responsive to said analyzing means for sampling the recreated digital waveform at different locations, thereby to monitor and display another parameter value.

4,408,227

METHOD AND APPARATUS FOR TELEVISION DISTRIBUTION SYSTEM SWEEP TESTING

Jack Bradley, Cupertino, Calif., assignor to Cushman Electronics, Inc., San Jose, Calif.

Filed Jun. 3, 1981, Ser. No. 269,796
Int. Cl.³ H04N 7/02
U.S. Cl. 358—139 **1 Claim**



1. Apparatus for testing television distribution networks comprising in combination: a synchronization detector connected to a television distribution network; a test signal genera-

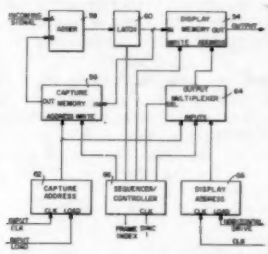
tor; means connecting the test signal generator and the synchronization detector to a generator timing and control unit means; means controlled by the generator timing and control unit for periodically suppressing program material; subcarrier generator means controlled by the generator timing and control unit; means for combining the test signal and the subcarrier; means coupling the combined subcarrier and the test signal to the television network; means along the television distribution network at a distance from the test signal generating means suitable to be connected to a test signal detector receiver; a test signal detector receiver connectable to said means to connect; a subcarrier receiver operable with said detector to receiver subcarried signals; data demodulator and synchronization seperator connected to said subcarrier receiver; detector timing and control means connected to said synchronization seperator and data demodulator; and a means connecting said detector receiver and detector timing and control means to a detector display.

4,408,228

METHOD AND MEANS FOR REDUCING NOISE IN TELEVISION DISPLAY SYSTEM

John E. Mahony, Sacramento, Calif., assignor to General Electric Company, Rancho Cordova, Calif.

Filed Nov. 2, 1980, Ser. No. 203,658
Int. Cl.³ H04N *5/21, 5/30;* G01N *29/00;* H04N *5/02*
U.S. Cl. 358—167 **1 Claim**



1. In a television display system in which video magnitude data is stored as digital data in a memory for control of the television display, apparatus for reducing noise in a displayed image comprising

means for generating first digital signals corresponding to magnitude of a video signal at a plurality of time intervals,

first memory means for storing said digital signals at addresses defined by said time intervals,

means for combining digital signals corresponding to magnitude of another video signal with corresponding digital signals stored in said first memory means,

a second memory means,

means for storing said combined values in said second memory means,

means for controlling said first memory means and said second memory means whereby said first memory means and said second memory means alternately receive combined digital data, and

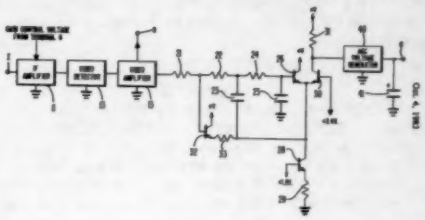
means interconnecting said firstmemory means and said second memory means with a television display whereby said combined digital data in said first memory means and in said second memory means alternately control said television display.

4,408,229

NOISE SENSITIVITY REDUCTION APPARATUS FOR A TV RECEIVER AGC SYSTEM

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 29, 1981, Ser. No. 268,497
Int. Cl.³ H04N *5/52*
U.S. Cl. 358—177 **7 Claims**



1. In a television receiver including an IF amplifier having a gain subject to control in accordance with a gain control potential supplied thereto, and a video detector responsive to the output of said gain controlled IF amplifier; an automatic gain control system comprising:

a low pass filter having an input and an output, and exhibiting a given cutoff frequency;

means responsive to an output of said video detector for supplying a composite video signal to said input of said low pass filter;

a source of reference potential;

voltage comparison means having a first input coupled to said source of reference potential and a second input coupled to said output of said low pass filter for developing an output variation when the potential at said second comparator input reaches a threshold potential related to said reference potential;

means having an input responsive to said output of said video detector, and having an output coupled to said second comparator input, for bypassing said low pass filter; said bypassing means being enabled only in the presence of a difference between the potentials at the input and output of said bypassing means of a given sense and of a magnitude exceeding a given magnitude; said bypassing means have a passband encompassing the passband of said low pass filter and extending beyond said cutoff frequency; and

means responsive to output variations of said voltage comparison means for developing said gain control potential.

4,408,230

PHOTOSENSOR ARRAY DEVICE

Katsuyoshi Tamura, Mobara, and Hiromi Kanai, Chiba, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,906
Claims priority, application Japan, Jul. 14, 1980, 55-95094
Int. Cl.³ H04N *1/12*
U.S. Cl. 358—213 **2 Claims**

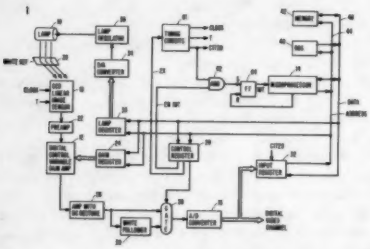
1. In a photosensor array device comprising an optical base having its bottom surface close to an original, a photoelectric conversion element formed above the upper surface of the

base, a plurality of conductor electrodes each connected at one end thereof to the photoelectric conversion element, and a drive circuit element connected to the other end of each of the conductor electrodes, the improvement wherein said device comprises a metal plate and a transparent insulating plate in combination of an area greater than the area of the upper surface of the base which is disposed on the upper surface of the base and on which the photoelectric conversion element, conductor electrodes and driving circuit element are formed and wherein said metal plate is formed with reinforcing grooves.

4,408,231
METHOD AND APPARATUS FOR CALIBRATING A LINEAR ARRAY SCANNING SYSTEM

Kenneth A. Bushaw, Longmont; Ronald D. Gillingham, Berthoud; Gary W. Jorgenson; Clyde L. Manning, both of Longmont, and Michael A. Steffes, Louisville, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,721
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—280 **20 Claims**



1. In a scanning system having means for illuminating the area to be scanned and scanning means having an array of photosensors for scanning the illuminated area and generating a video signal time segmented into pel (picture element) intervals representative of the light reflected from picture elements (pels) of the illuminated area, the improvement comprising:

means for monitoring at least one pel interval in the time segmented video signal to detect saturation of said scanning means;

means for incrementing the intensity of illumination provided by said illuminating means until said monitor means detects said scanning means has saturated; and

means responsive to scanner saturation detection by said monitor means for decrementing the intensity of illumination provided by said illuminating means to a predetermined proportion of the saturation intensity.

4,408,232
IMAGE READING DEVICE

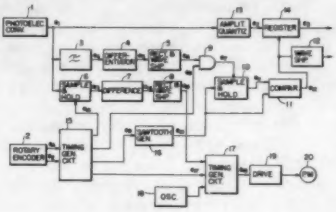
Satoru Itoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,144
Claims priority, application Japan, Sep. 9, 1980, 55-124049
Int. Cl.³ H04M *1/40*
U.S. Cl. 358—280 **5 Claims**

1. An image reading device of a type wherein an analog image signal representing an image on an original is sampled to provide a binary electrical signal corresponding to a density distribution of the original, comprising:

a sampling pulse generating circuit for detecting a phase difference between a reference line provided on said original and a first sample pulse signal and outputting a second sampling pulse in phase with said reference line as a function of said detected phase difference;

an amplitude quantizing circuit for converting said analog image signal into a binary electrical signal; and

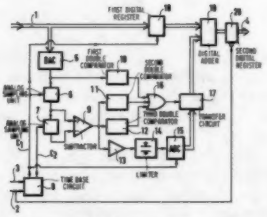


a register receiving an output signal of said amplitude quantizing circuit and said sampling pulse signal for producing a sampled binary electrical signal such that, after said sampling pulse signal is in phase with said reference line on said original, said analog image signal is converted into said binary electrical signal.

4,408,233
METHOD AND APPARATUS FOR ACCENTUATING THE FEATURES OF A MONOCHROME IMAGE REPRODUCED BY MEANS OF A DIGITAL TRANSCRIPTION

Richard Nahon, and Jean-Claude Decuyper, both of Maurepas, France, assignors to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 12, 1982, Ser. No. 357,541
Claims priority, application France, Mar. 12, 1981, 81 04941
Int. Cl.³ H04N *1/40, 5/14*
U.S. Cl. 358—284 **5 Claims**

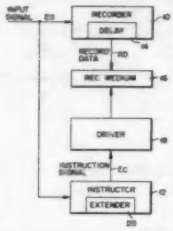


1. A method of accentuating features in a monochrome image, comprising the steps of scanning said image as a succession of elementary zones and transcribing the grey level of each successive zone as a digitally encoded number, the improvement comprising selecting a number from the resulting sequence of numbers when said number falls within a predetermined range of mid value greys and when said number differs from the immediately preceding number in the sequence by a non-zero value of absolute amplitude which is lower than a predetermined threshold, modifying the value of each selected number by adding an accentuation term thereto which is proportional to the difference between the selected number and the immediately preceding number in the sequence, at least over a predetermined range of differences.

4,408,234
RECORDING APPARATUS WITH AUTOMATIC ACTUATOR

Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,629
Claims priority, application Japan, Jul. 11, 1980, 55-94795
Int. Cl.³ G11B *15/00*
U.S. Cl. 360—69 **8 Claims**



1. A recording apparatus with automatic actuator comprising:

(a) recording means for recording a recording signal on a recording medium;

(b) drive means for moving said recording medium at a prescribed speed;

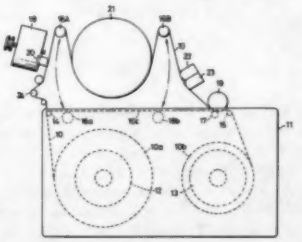
(c) instruction means coupled to said drive means and responsive to said recording signal for providing an instruction signal for moving said recording medium to said drive means for a period, during which the magnitude of said recording signal is above a fixed sense level; and

(d) delay means coupled to said recording means for delaying said recording signal for a delay period substantially equal to or longer than a first period from an instant when said instruction means provides said instruction signal till an instant when said prescribed speed is substantially reached by said recording medium.

4,408,235
RECORDING MODE LOCKING SYSTEM IN A VIDEO SIGNAL MAGNETIC RECORDING APPARATUS

Yukio Ito, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 3, 1981, Ser. No. 269,886
Claims priority, application Japan, Jun. 4, 1980, 55/75313
Int. Cl.³ G11B *15/18, 5/52*
U.S. Cl. 360—71 **4 Claims**



1. A recording mode locking system in a video signal magnetic recording apparatus having loading means operating between loaded and unloaded states, a magnetic tape which is loaded from a predetermined position into a predetermined tape path and which is unloaded from the loaded state, a power source swith which closes or opens for supplying or interrupting a source power to the apparatus, and means for enabling said loading means to perform an unloading operation when said power source switch is closed, said recording mode locking system comprising:

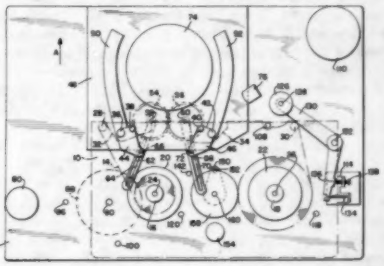
locking switch means which is activated for locking the recording mode; and

recording mode signal producing means for producing a recording mode signal upon the closing of said power source switch where said locking switch means is in an activated state and said tape is in a loaded state, said loading means remaining in said loaded state responding to the recording mode signal.

4,408,236
MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

Shigeki Murata, Nara; Jirou Kajino, and Hitoshi Minabe, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 30, 1981, Ser. No. 230,367
Claims priority, application Japan, Feb. 8, 1980, 55-15263
Int. Cl.³ G11B *5/08, 15/00*
U.S. Cl. 360—85 **9 Claims**



1. A magnetic tape recording and/or reproducing apparatus for recording and/or reproducing signals on a magnetic tape wound on reels contained in a tape cartridge, said apparatus comprising:

a pair of reel drive turntables engagable with the reels for rotating the reels;

tape moving means for moving the magnetic tape at a constant speed;

means for carrying out recording and/or reproducing of signals on/from the magnetic tape in a specific tape path outside of the tape cartridge;

loading means for drawing the magnetic tape out of the tape cartridge and loading the magnetic tape in said specific path;

a loading means and operating mode changing means driving motor;

intermittent driving means driven by said motor and connected to said loading means for changing the rotational motion of a motor to an intermittent motion for driving said loading means; and

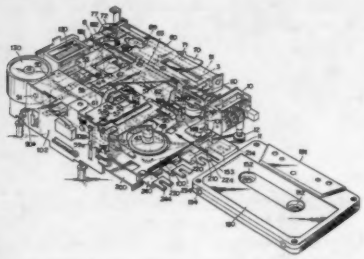
operating mode changing means comprising a rotating member driven by said motor and which rotates to a plurality of positions in synchronization with the rotation of said motor for changing the operating mode of said apparatus to operating modes corresponding to the respective ones of said plurality of positions.

4,408,237

MAGNETIC RECORD/PLAYBACK APPARATUS

Yuji Takahashi; Hideki Hayashi; Satoshi Takagi, and Ito Yukio, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1980, Ser. No. 191,266
Claims priority, application Japan, Sep. 29, 1979, 54-125916
Int. Cl.³ G11B 15/28, 15/22, 5/54, 21/22
U.S. Cl. 360—96.3 3 Claims



1. In a magnetic record/playback apparatus including a head plate on which a recording/playback head and first and second pinch rollers are supported, first and second capstans associated respectively with said first and second pinch rollers, manually operable play-operation means for displacing said head plate from an inoperative position to a play position where said head is adjacent the tape and the pinch rollers are adjacent to said capstans, first changeover means having first and second positions respectively before and subsequent to an end of tape condition of the apparatus for alternatively moving said first and second pinch rollers respectively against the tape to press the same against the associated one of the capstans, so as to effect respectively forward and reverse tape feeding directions, second changeover means movable with said first changeover means and having corresponding first and second positions respectively for rotating the takeup side of the tape pack to effect respectively forward and reverse tape feeding directions, tape pack receiving and positioning means for receiving and positioning a magnetic tape pack inserted into the apparatus in a play-position so that the tape is adjacent to said head and pinch rollers when said head plate is in said play-position, and manually operable ejecting means for ejecting said tape pack from said play-position, the improvement which comprises: first means moved upon operation of said manually operable ejecting means when effecting an ejecting operation, and second means associated with said changeover means which is engaged by said first means during an ejection operation when said changeover means are in said second position to effect a reverse tape feeding direction, moving said changeover means into said first position whereby reproducing is automatically resumed in a forward feeding direction after a tape pack ejection operation is carried out and upon resumption of a play-operation.

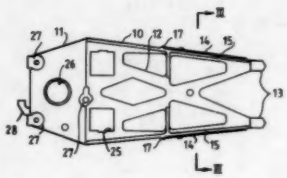
4,408,238

MAGNETIC HEAD ARM ASSEMBLY

Anthony R. Hearn, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,218
Claims priority, application European Pat. Off., Mar. 18, 1981, 81301162.4
Int. Cl.³ G11B 5/48, 5/016, 21/16
U.S. Cl. 360—104 8 Claims

1. A head support arm for a disk file adapted to support a transducing head at one end and adapted at the other end to be mounted on a positioning apparatus in cantilever fashion, the arm comprising a relatively rigid beam structure of flattened cross section defining a plane therethrough, which structure is susceptible to out-of-plane resonances, and damping means to damp said resonances, characterized in that said damping means comprises a relatively rigid sidebar means located alongside one longitudinally extending edge of the beam structure, and a layer of relatively compliant damping material



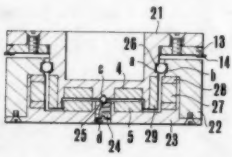
providing a mechanical connection between the sidebar means and the beam structure whereby out-of-plane resonances of the beam structure are damped by shear of the damping material as a result of relative motion between the beam and sidebar means.

4,408,239

ROTARY MAGNETIC HEAD DRUM ASSEMBLY FOR MAGNETICALLY RECORDING AND/OR REPRODUCING DEVICE

Tatsuzo Ushiro, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1981, Ser. No. 272,543
Claims priority, application Japan, Jun. 12, 1980, 55-79258
Int. Cl.³ G11B 5/52, 15/60
U.S. Cl. 360—107 13 Claims



1. A rotary magnetic head drum assembly for a helical scanning type magnetically recording and/or reproducing device comprising a rotary drum having a magnetic head on the circumference and a driving part at the part inside of the circumference and a stationary drum having a driving coil arranged so as to face to the driving part and a circumference whose diameter is almost the same as that of the circumference of the rotary drum, wherein on the circumferential surface of a cylinder whose diameter is smaller than that of the circumference of the rotary drum at least one ring groove is provided, while in a space between the ring groove and that provided on the internal circumference of the cylinder of the stationary drum so as to face to the former ring groove a plurality of steel balls are inserted so as to constitute a bearing, by means of which the rotary drum is freely rotatable.

4,408,240

MULTICHANNEL MAGNETIC HEAD FOR A RECORDER-REPRODUCER SYSTEM

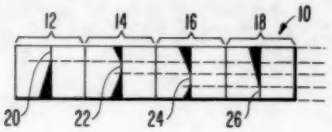
David C. Pastore, Berlin, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 87,450, Oct. 22, 1979, abandoned. This application Aug. 6, 1981, Ser. No. 290,499

Claims priority, application United Kingdom, Aug. 23, 1979, 7929476

Int. Cl.³ G11B 5/27, 5/28

U.S. Cl. 360—121 2 Claims



1. A multichannel magnetic transducer head arrangement for transducing parallel tape tracks in a video tape recorder, comprising:

a plurality of individual transducers, each transducer including first and second magnetic pole pieces, said first and second pole pieces defining a block with first and second parallel sides having a predetermined width and also defining a face substantially orthogonal to said first and second sides, said face being adapted for operative contact with magnetic tape, said first and second pole pieces defining said face being separated by a magnetic gap in said face, said gap lying in a plane substantially parallel with said first and second sides and having a width equal to that of said width of said pole pieces, the length of said gap being small over a predetermined portion of the width of said pole pieces and gradually becoming larger over at least a portion of the remainder of said width, each of said plurality of transducers having said small portion of said gap along a different portion of said width; and

nonmagnetic bonding means for mechanically bonding together said plurality of individual transducers along adjacent ones of said parallel sides with said faces of said transducers lying substantially in the same plane and with said gaps lying in parallel planes, said bonding means producing magnetic isolation between the pole pieces of adjacent transducers for reducing crosstalk between said transducers whereby said small portion of each of said gaps can scan across a different lateral portion of said tape with substantially no separation between said tracks.

4,408,241

CLEANING DEVICE

Kenji Ogawa, Kiyose, Japan, assignor to Bruce R. Maier, Columbia, Mo.

Filed Jun. 9, 1981, Ser. No. 271,948

Int. Cl.³ G11B 5/10, 5/41, 3/58; B47L 25/00

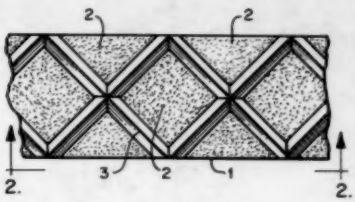
U.S. Cl. 360—128 25 Claims

1. A cleaning device for a contact-type information transducing head comprising:

a base;

means for defining a plurality of raised areas projecting away from at least one surface of the base, said raised areas adapted to remove material from and clean the transducing head; and

an adhesive deposited on the at least one surface of the base between the plurality of raised areas, said adhesive



adapted to capture material removed from the transducing head by the raised areas.

4,408,242

MAGNETIC RECORDING MEMBER FOR AUTOMATIC EMBROIDERING MACHINE

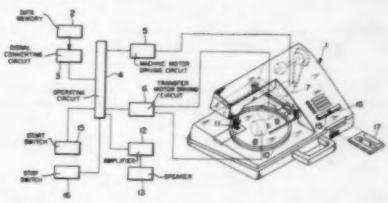
Koji Nishida, and Taneichi Kawai, both of Anjo, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 16, 1981, Ser. No. 302,821

Claims priority, application Japan, Sep. 29, 1980, 55-135549

Int. Cl.³ G11B 31/00, 23/16

U.S. Cl. 360—131 3 Claims



1. A magnetically-recorded program member for use with a program-operated, automatic embroidery machine having embroidery controlling circuitry and an audio speaker, the recorder program member comprising:

a plurality of control data recording blocks, each of said control data recording blocks including control data indicating at least one of a thread change, frame change, and applique cloth application; and

a plurality of voice recording blocks, each of said voice recording blocks being associated with a different one of said control data recording blocks and including signals for actuating said speaker to generate an audio message identifying the control data stored in said associated control data recording block.

4,408,243

TAPE CLEANER

Clive E. Bonner, and Herbert F. Sanford, both of Littleton, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 21, 1981, Ser. No. 295,151

Int. Cl.³ G11B 5/76

U.S. Cl. 360—137 10 Claims

1. A tape cleaner comprising

a tape wiping medium,

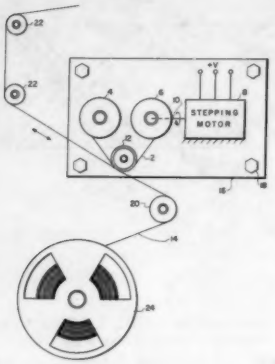
medium support means for supporting said medium in contact with a face of a tape to be cleaned,

medium drive means for transporting said medium past said face of the tape to the cleaned in response to a drive signal,

tape drive means for driving a tape to be cleaned at a preselected tape speed in response to a control signal,

tape speed selection means for producing said control signal

for controlling said tape drive means at a selected one of a plurality of different tape speeds, and



drive signal means connected to said tape drive means for developing said drive signal to drive said wiping medium at a sub-multiple of said selected tape speed.

4,408,244

CIRCUIT SAFE AGAINST OVERLOAD FOR VARYING THE AMOUNT OF POWER TO AN ELECTRIC BLOWER MOTOR

Reinhold Weible, Stuttgart, Fed. Rep. of Germany, assignor to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 913,687, Jun. 8, 1978, abandoned. This application May 14, 1980, Ser. No. 149,832

Int. Cl.³ H02H *7/085*

U.S. Cl. 361—24 **10 Claims**

1. In a vehicle having a direct current blower motor used for heating, ventilating or air conditioning, a circuit for controlling said motor to cause the motor to operate at one of at least two incremental speeds, a direct current power source, a main power line extending from said power source to a selector switch, a main system fuse in said power line between said source and said selector switch,

at least two branch circuits corresponding in number to said at least two speeds at which said motor is to be operated, a first of said two branch circuits interconnecting said motor to said selector switch, said selector switch selecting one only of said branch circuits at a time to interconnect said motor and said power source, said fuse being operative to protect a first one of said branch circuits, and at least one PTC resistor in at least a second one of said branch circuits; whereby said PTC resistor in said at least second one of said branch circuits protects said motor when said selector switch connects said at least one PTC resistor to said motor by limiting the current to said motor, thereby automatically reducing the speed of said motor when the predetermined temperature of said PTC resistor is exceeded, and whereby said at least one PTC-resistor protects itself against thermal overload and the blower motor and the circuit for supplying variable power are also protected from thermal overload; and whereby said main system fuse protects said motor when a branch circuit not containing a PTC resistor is connected by said selector switch to said motor.

4,408,245

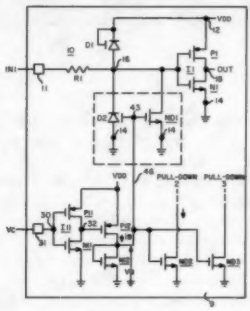
PROTECTION AND ANTI-FLOATING NETWORK FOR INSULATED-GATE FIELD-EFFECT CIRCUITRY

Richard L. Pryor, Voorhees, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,819

Int. Cl.³ H02H *9/04*

U.S. Cl. 361—56 **9 Claims**



1. A combined gated diode and insulated-gate field-effect transistor (IGFET) comprising:

a heavily doped first region of first conductivity type;

a lightly doped second region of second conductivity type enclosing said first region;

a control electrode isolated from and overlying said second region;

a heavily doped third region of said second conductivity type substantially surrounding said second region, said third region having a gap;

said first and third regions forming the anode and cathode of said gated diode;

a fourth heavily doped region of said first conductivity type formed within said gap, spaced apart from the ends of said third region and abutting said second region, said first and fourth region forming the source and drain of said IGFET, and said control electrode being the common gate electrode of said IGFET and the gate electrode of said gated diode.

4,408,246

PROTECTIVE RELAY APPARATUS

Roger E. Ray, Coral Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1982, Ser. No. 339,031

Int. Cl.³ H02H *7/26, 3/28*

U.S. Cl. 361—64 **11 Claims**

1. A protective relay system for providing pilot protection for an alternating current transmission line section having circuit interrupting means at its near and far ends to be protectively controlled, comprising:

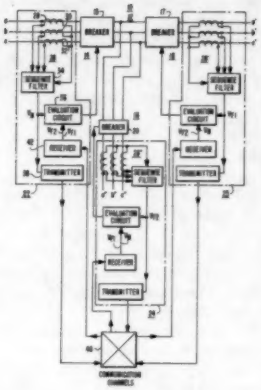
line current deriving means at the near and far ends of the line section, providing near and far composite sequence signals responsive to the magnitudes and phases of the line currents at the near and far ends, respectively,

communication means communicating the far signal to the near end,

first means providing an operating quantity in response to the absolute value of the vector combination of said near

and far signals, with said vector combination being selected such that the absolute value thereof increases when a fault occurs in the protected section,

second means providing a restraining quantity in response to the absolute value of at least one of said near and far signals,



and third means modifying one of said quantities with a predetermined constant such that the difference between the quantities is indicative of a fault in the protected section when said difference bears a predetermined relationship with a predetermined pick-up value, with the magnitude of said modifying constant being determinative of the tripping characteristic of the protective relay system.

4,408,247

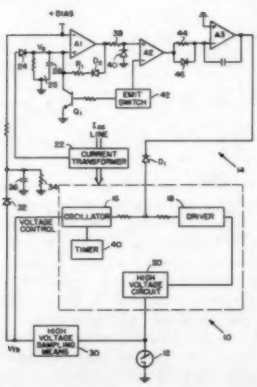
HIGH VOLTAGE PROTECTION CIRCUIT FOR X-RAY SYSTEMS

David Cowell, Webster, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Sep. 10, 1980, Ser. No. 185,776

Int. Cl.³ H02H *3/38*

U.S. Cl. 361—79 **5 Claims**



1. A protection circuit, for a x-ray power supply energized by line current of the type which multiplies a low voltage drive signal to obtain a high voltage, comprised of:

means for providing a line current monitor signal;

means for providing a high voltage monitor signal;

means for providing a first voltage if the line current monitor signal is more than the high voltage monitor signal, and a second voltage if the line current monitor signal is less than the high voltage monitor signal; and

means for turning off the high voltage of the x-ray power supply in response to the first voltage.

4,408,248

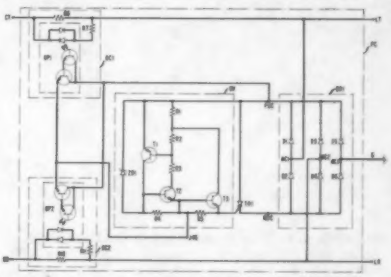
PROTECTION CIRCUIT

Raymond M. Bulley, Whippany, N.J.; William F. MacPherson, Wheaton, Ill., and Robert F. Youhas, Parsippany, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1981, Ser. No. 335,623

Int. Cl.³ H02H *9/04*

U.S. Cl. 361—91 **11 Claims**



1. A protective circuit connected between communication equipment having tip and ring leads and a communication line having tip and ring conductors, the protective circuit comprising

a six element bridge rectifier (BR1) having three alternating current terminals (AC1, AC2, AC3) and two direct current terminals (PDC, NDC), the alternating current terminals being connected to, respectively, the tip and ring conductors, and to ground, and

means (OC, OV, TH1) connected between said direct current terminals responsive to a range of predetermined voltage and current conditions in the tip and ring conductors for reflecting foreign electrical energy applied to the tip and ring conductors.

4,408,249

TOTALLY ENCLOSED SURGE ARRESTER

Gaston Ecklin, Wettswil, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

PCT No. PCT/CH81/00022, § 371 Date Nov. 17, 1981, § 102(e) Date Nov. 17, 1981, PCT Pub. No. WO81/02812, PCT Pub. Date Oct. 1, 1981

PCT Filed Feb. 26, 1981, Ser. No. 324,392

Claims priority, application Switzerland, Mar. 19, 1980, 2148/80

Int. Cl.³ H01T *5/04*

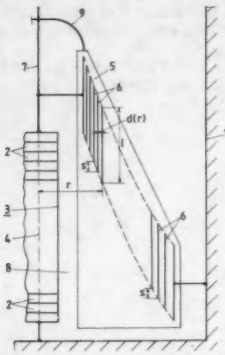
U.S. Cl. 361—127 **2 Claims**

1. A surge arrester comprising an electrically conductive, grounded enclosure filled with an insulating gas in which are disposed disc-shaped active arrester elements arranged one above another to form at least one columnar active portion which is connected between a high potential and a ground potential, and screening and controlling bodies for producing a linear potential distribution along said columnar active portion of the arrester,

said screening and controlling bodies comprising electrically conducting coatings disposed in a body composed of insulating material, wherein the coatings are offset with respect to each other, are parallel to the column-axis of

said active portion, and surround said active portion substantially concentrically,

wherein the coating which is located at the shortest distance from said active portion is disposed opposite that part of said active portion which is at high potential and the coating which is located at the largest distance from said active portion is disposed opposite that part of said active portion which is at ground potential,



and wherein said insulating body is externally configured, at least partially, as a truncated cone, and internally defines channels, extending along said at least one active portion, through which the insulating gas circulates, thereby carrying away any heat which may occur at the active portion.

4,408,250

CIRCUIT FOR REMOTELY OPERATING AN ELECTROMAGNETIC RELAY

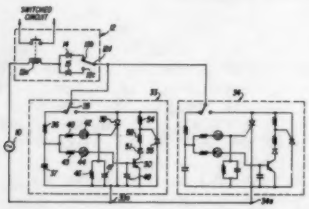
Toshiyuki Masuda, Matsuzaka, Japan, assignor to Matsushita Denko Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1981, Ser. No. 275,850

Claims priority, application Japan, Jul. 8, 1980, 55-096686[U]

Int. Cl.³ H01H *47/22*

U.S. Cl. 361—160 **7 Claims**



1. A system for controlling an electrical load comprising:

a magnetic latching relay, said relay comprising a pair of relay control conductors, a load switching pair of contacts, a switch assembly comprising an auxiliary pair of contacts selectively connected to a moving contact and first and second diodes, one end of each of said diodes being connected to a respective one of said auxiliary contacts, the remaining ends of said diodes being commonly connected, said first diode being connected to conduct an electrical current in a direction opposite to an electrical current conducted in said second diode, said switching assembly having a first current carrying conductor defined by the common connection of the diodes and a second current carrying conductor defined by the moving contact, and a control winding, said moving contact and switching contacts having a state determined by the direction of an electrical current in said control winding, one end of said control winding being connected to one of said current carrying conductors, the other end of said control winding being connected to one of said relay control conductors, the other of said current carrying conductors being connected to the other of said relay control conductors;

a control circuit for switching electrical current through said relay control conductors comprising:

a switch having a movable contact, positionable between first and second fixed contacts, said movable contact being connected to one of said relay control conductors;

a common terminal;

a first current path connected between said first contact and said common terminal, said path including a capacitor and resistor;

a second current path connected between said second contact and said common terminal, said second current path comprising first and second silicon controlled rectifiers connected in parallel for carrying current in opposite directions; and

means for supplying a control current from said capacitor to control gates of said rectifiers; and

means for applying a voltage between said common terminal and a remaining one of said relay control conductors, whereby when said switch movable contact is moved from said first contact to said second contact a current flows through said relay winding changing the state of said relay contacts.

4,408,251

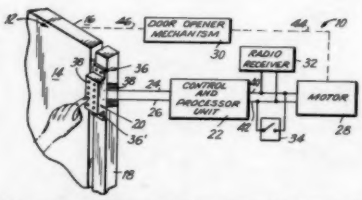
TAMPER-RESISTANT SECURITY SYSTEM FOR AND METHOD OF OPERATING AND INSTALLING SAME

Irwin M. Kaplan, East Northport, N.Y., assignor to Spectrum Four-Syte Corporation, Hauppauge, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,945

Int. Cl.³ E05B *49/00*

U.S. Cl. 361—172 **14 Claims**



1. A tamper-resistant security system for electronically controlling the movement of a garage door which has an exterior side wall that faces a publicly accessible exterior area, and an interior side wall that faces a secured interior garage area, said garage door being movable relative to an adjacent garage door jamb between a closed and an open position in which entry from the exterior area to the interior garage area is barred and permitted, respectively, said security system comprising:

(a) manual encoding means mounted on the door jamb and being located solely in the exterior area, said encoding means being operative for generating coded electrical signals including a predetermined sequence of coded electrical timing signals required to move the garage door from the closed to the open position, each timing signal having a time duration indicative solely of each individual user's sense of timing;

(b) non-prompting control means located solely in the interior garage area and operative for detecting the generation of the coded electrical signals, and for moving the garage

door from the closed to the open position in response to detection of the predetermined coded timing signal sequence; and

(c) electrical signal transmission means for conducting the coded electrical signals from the exterior area to the interior garage area, said transmission means being constituted solely by a pair of electrical conductors extending between the exterior and interior areas and interconnecting the encoding means and the control means,

whereby the transmission of the predetermined coded signal sequence over the pair of electrical conductors is the sole way of moving the garage door by operation of the encoding means on the door jamb so that the intruder access to any point along the pair of electrical conductors, and particularly to the connection in the exterior area between the encoding means and the pair of electrical conductors, is the equivalent in terms of system security to intruder access to the encoding means, to thereby deter the intruder from compromising system security by shorting or bridging the pair of electrical conductors or otherwise tampering with the system.

4,408,252

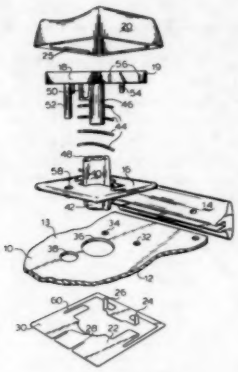
LOW PROFILE KEYBOARD SWITCH

Andrew Voge, Arcadia; Daniel R. Sparks, Temple City, and Barry W. Mullins, Glendora, all of Calif., assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Feb. 16, 1982, Ser. No. 349,349

Int. Cl.³ H01G *5/16*; H01H *3/12*

U.S. Cl. 361—288 **20 Claims**



1. Apparatus for a capacitive switch for a low profile keyboard comprising

(a) a printed circuit board;

(b) a fixed capacitor plate;

(c) a movable capacitor plate;

(d) a movable plunger key body for moving said movable capacitor plate from a first position adjacent said fixed capacitor plate to a second position away from said fixed capacitor plate;

(e) resilient means positioned between said plunger key body and said printed circuit board for urging said plunger key body from said second position to said first position;

the improvement characterized by

(f) an etched metallic laminate on the bottom surface of said printed circuit board with a portion thereof forming said printed circuit and said fixed capacitor plate;

(g) a guide opening in said printed circuit board;

(h) a guide body with a portion thereof extending through and in snap-fit engagement with said guide opening;

(i) a guide stem integral with said plunger body for reciprocable cooperating guiding engagement with said guide body;

(j) cooperating integral locking means on said guide body and said plunger body for maintaining said guide body and said plunger in a fixed reciprocable relationship with each other;

(k) an integral switch activation stem on said plunger body reciprocable with said plunger body through cooperating openings in said guide body and said printed board;

(l) said switch activation stem for moving said movable capacitor plate from said first position to said second position.

11. The apparatus of claim 1, further characterized by

(a) a key cap snap-fitted to the top of said plunger key body.

4,408,253

VARIABLE CAPACITOR

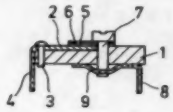
Atsushi Nishino, Neyagawa; Tadashi Suzuki, Katano; Masaki Ikeda, Hirakata, and Tadashi Ohtani, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 7, 1981, Ser. No. 261,739

Claims priority, application Japan, May 12, 1980, 55-63255; May 12, 1980, 55-63256

Int. Cl.³ H01G *5/06*

U.S. Cl. 361—293 **12 Claims**



1. A variable capacitor including a stator electrode, a base plate for supporting said stator electrode, a rotor electrode rotatably mounted on said base plate and above said stator electrode and a layer of a dielectric material being sandwiched between the both electrodes;

characterized in that;

at least one of said stator and rotor electrodes is made of an aluminum alloy and is coated with a baked layer containing fluorocarbon resin as its principal ingredient which serves as said layer of dielectric material,

said aluminum alloy being of a purity under 96 w/w %, and containing 0.1–5.0 w/w % of copper, silicon, iron and manganese.

4,408,254

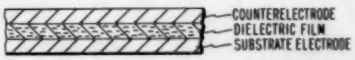
THIN FILM CAPACITORS

Wei-Kan Chu, Poughkeepsie, and James K. Howard, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,360

Int. Cl.³ H01G *4/20*

U.S. Cl. 361—321 **4 Claims**



1. A thin film capacitor comprising a substrate electrode, a dielectric film on said electrode with said film comprising an amorphous titanate implanted with noble gas ions, and a counterelectrode opposing said substrate electrode and spaced therefrom by said dielectric film.

4,408,255

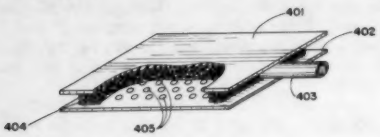
ABSORPTIVE ELECTROMAGNETIC SHIELDING FOR HIGH SPEED COMPUTER APPLICATIONS

Harold Adkins, 56 Camille La., East Patchogue, N.Y. 11772

Filed Jan. 12, 1981, Ser. No. 224,319

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—382 **2 Claims**



1. An electromagnetic interference shield for direct application to circuitry, comprising:

(a) a flexible mat of porous electrically lossy material,

(b) a first sheet of continuous conductive material which is impervious to liquids,

(c) means for bonding the first sheet to a first side of the mat to form a composite shield,

(d) a second sheet of conductive material bonded to the second side of the mat, the second sheet of conductive material containing a plurality of openings passing through the sheet and the shield further comprising means for forcing the fluid between the sheets through the pores of the mat and out through the plurality of openings to aid in adjusting the temperature of the circuitry adjacent the second sheet of conductive material.

4,408,256

MICROBOX FOR ELECTRONIC CIRCUIT AND HYBRID CIRCUIT HAVING SUCH A MICROBOX

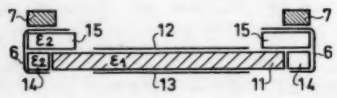
Christian Val, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 148,043, May 8, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,907

Claims priority, application France, May 10, 1979, 79 11852

Int. Cl.³ H05K *7/02*

U.S. Cl. 361—403 **5 Claims**



1. A chip carrier for an electronic circuit comprising a partially metallized substrate to which is fixed a circuit chip, wherein said substrate is made up of a plate which has at least one metallized region on each face in order to form the foils of at least one capacitor, wherein said substrate is formed of a rigid material chosen from among those having a high dielectric constant, and wherein said chip carrier has output connections which are supported by a frame integral with said substrate, with said frame being made from a material having a low dielectric constant.

4,408,257

CATHODE ELECTRODE FOR AN ELECTRICAL DEVICE

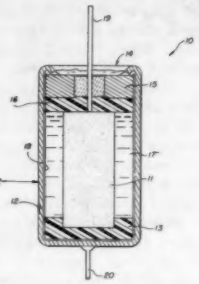
Charles W. Walters, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Dec. 8, 1980, Ser. No. 214,014

Int. Cl.³ H01G *9/00*

U.S. Cl. 361—433 **3 Claims**

1. A capacitor comprising an anode electrode, a copper-based cathode electrode, and dielectric means between the anode electrode and the copper-based cathode electrode, the copper-based cathode electrode including a surface contacted by at least semi-liquid electrolyte, said surface further including a deposit of silver coated with a finely divided electrically conductive material taken from the group consisting essentially of graphite, platinum and palladium.



4,408,258

ALUMINUM ELECTRODE CAPACITOR AND GLYCOL FILL ELECTROLYTE THEREFOR

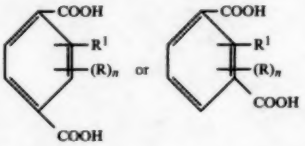
Roland F. Dapo, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 190,147, Sep. 24, 1980, abandoned, which is a continuation of Ser. No. 61,120, Jul. 27, 1979, abandoned. This application Nov. 27, 1981, Ser. No. 325,515

Int. Cl.³ H01G *9/02*

U.S. Cl. 361—433 **5 Claims**

1. An electrolytic capacitor comprising aluminum anode and cathode members separated by an insulating spacer impregnated with an electrolyte consisting essentially of a solution in ethylene glycol of the neutralization product of about 2 mols of dimethylamine, diethylamine or piperidine and about 1 mol of dicarboxylic aromatic acid of the formulae



where in each case R is alkyl of 1–6 carbon atoms, alkoxy of 1–6 carbon atoms, alkenyl of up to 6 carbon atoms, benzoyl, phenyl, nitro or phenoxy, R^1 is hydrogen or alkyl of up to 6 carbon atoms and n is an integer of 0–3.

4,408,259

ELECTROCHEMICAL DOUBLE-LAYER CAPACITOR

Takayoshi Muranaka, and Hajime Mori, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Feb. 4, 1980, Ser. No. 118,078

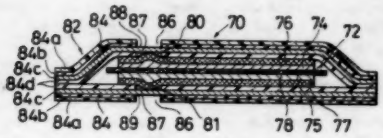
Claims priority, application Japan, Feb. 9, 1979, 54-14743; Feb. 9, 1979, 54-14746; Jun. 1, 1979, 54-69324; Jun. 1, 1979, 54-69325

Int. Cl.³ H01G *9/00, 9/04, 9/08*

U.S. Cl. 361—434 **10 Claims**

1. An electrochemical double-layer capacitor which comprises a capacitor element including a pair of polarization electrodes each made of active carbon and a binder for the active carbon, supported on a sheet-like collector; a spacer

separating the pair of polarization electrodes and impregnated with an electrolyte solution; and a hermitically sealed enclosure encasing said capacitor element, the enclosure being formed by heat-sealing one or more composite films, each of



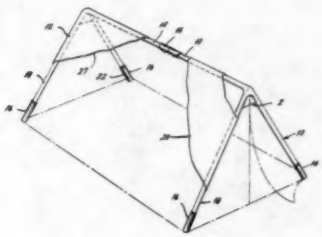
said composite films being a laminate, in order, of a polyethylene film, aluminium film, polyethylene film and polypropylene film, or a laminate, in order, of a polyethyleneterephthalate film, aluminium film, polyethyleneterephthalate film, polyethylene film and polypropylene film.

4,408,260

TENT CONSTRUCTION HAVING ILLUMINATING MEANS

Roland E. Miedel, 604 Seminole Ave., Fox Chase Manor, Philadelphia, Pa. 19111

Filed Feb. 13, 1981, Ser. No. 234,301
Int. Cl.³ F21V *7/04*
U.S. Cl. 362—32 **7 Claims**



1. A tent comprising

a structural framework composed of a plurality of structural members, the members having a housing and an elongated transparent solid, rigid light post extending away from said housing;

a light source within said housing for introducing light into said transparent light post for passage a through said light post;

a battery unit within said housing for powering said light source;

switch means in said housing for selectively connecting said battery unit to said light source;

a covering fitted over said structural framework to form a shell;

means releasable securing said covering to said structural framework to expose the surface of said structural framework to the interior of said tent; said securing means comprising two mating releasable engaging strips, one secured longitudinally of the structural framework, and the other secured to the tent covering and exposing the inner approximate half of said framework to the interior of said tent; and

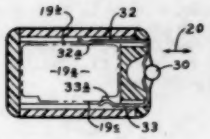
a ridge pole comprising light posts and bidirectional illumination means contained in the middle of said pole, said pole fruther containing slots near the ends of said light posts, said slots tightly fitting with slots formed at the apex of the other structural members, and a web between the members for structural support at said apex.

4,408,261

BATTERY OPERATED CHARM LIGHT

Frank Polakoff, 8140 Vanscoy Ave., North Hollywood, Calif. 91605

Filed Jan. 18, 1982, Ser. No. 340,235
Int. Cl.³ F21L *15/08*
U.S. Cl. 362—104 **11 Claims**



1. In a battery operated charm light, the combination, comprising

(a) a case having a zone to contain a battery having two terminals spaced from the case,

(b) an LED having two unequal length leads within the case and one of which is located to always engage one battery terminal,

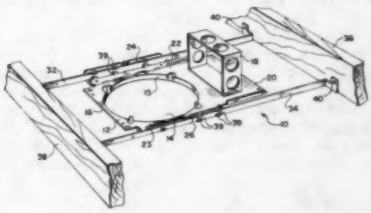
(c) and a part linearly movable back and forth relative to the case to effect engagement and disengagement of the other lead with the other battery terminal, said part comprising a cap for the end of the case and carried for movement toward and away from said zone, the LED carried by said cap.

4,408,262

PLASTER FRAME FOR RECESSED LIGHTING

Raymond J. Kusmer, Elgin, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jun. 1, 1982, Ser. No. 384,025
Int. Cl.³ F21S *1/02*
U.S. Cl. 362—147 **9 Claims**



1. A plaster frame for mounting a lighting fixture in recessed fashion in a predeterminedly dimensioned aperture defined in a ceiling, said ceiling being supported by predeterminedly spaced ceiling joists, said plaster frame including in combination:

a main body portion including a planar member, said planar member defining an aperture therein dimensioned similarly to said aperture defined in said ceiling;

first and second hanger bar brackets integrally formed with said planar member along first and second breakaway junctions, respectively, generally located along first and second sides of said planar member, respectively, said hanger bar brackets being adapted for receipt of hanger bars for mounting said plaster frame in a first orientation between said ceiling joists with said aperture defined in said planar member being aligned with said ceiling aperture, said hanger bar brackets being detachable from said planar member at said breakaway junctions;

each said hanger bar bracket including means for reattaching said hanger bar bracket to said planar member at third and

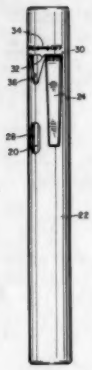
fourth sides thereon, respectively, said third and fourth sides being generally perpendicular to said first and second sides, for mounting said plaster frame between said ceiling joists in a second orientation different from said first orientation.

4,408,263

DISPOSABLE FLASHLIGHT

Mark Sternlicht, Stamford, Conn., assignor to Wonder Corporation of America, Norwalk, Conn.

Filed Dec. 14, 1981, Ser. No. 330,477
Int. Cl.³ F21L 7/00
U.S. Cl. 362—189 **2 Claims**



1. In a disposable flashlight having a battery and light within a casing, a conductive clip engaging the battery, and a conductive member engaging a terminal of the light and extending into proximity with the end of the clip so that the end of the clip can be pushed through a contact opening in the casing into electrical contact with said conductive member to turn on the light, the improvement comprising,

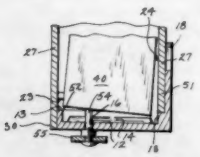
a peripheral slot in the casing through which the clip extends, said slot extending a distance along the circumference of the casing such that the clip can be rotated to an "off" position where said clip end does not overlie said contact opening to thereby prevent the light from being energized by the application of pressure to said clip end, said slot further including a detent between its ends so as to retain the clip in its "off" and "on" positions.

4,408,264

WARNING LIGHT HOUSING

Wilton K. Decker, 249 Antoine Dr., Port Washington, Wis. 53074

Continuation-in-part of Ser. No. 298,009, Aug. 31, 1981. This application Jul. 19, 1982, Ser. No. 399,327
Int. Cl.³ F21L 7/00
U.S. Cl. 362—200 **6 Claims**



1. In a light assembly, the combination comprising:

a base having a supporting platform with a recess in its upper face that has a bottom, side walls and an open top, said base also having an access hole in a recess side wall leading into said recess from the exterior;

a removable casing fitting over said base to form a housing therewith, said casing having a cavity with side walls and a top extending above said recess;

a coupling between said base and casing for assembly and disassembly of said casing with and from said base in a lateral movement, said coupling restricting vertical removal of said casing from said base;

a light assembly component insertable in said casing cavity which recedes into said recess upon assembly of the component with said base and casing, said component being in interfering position with sidewalls of said cavity and said recess to block lateral disassembly of said casing from said base; and

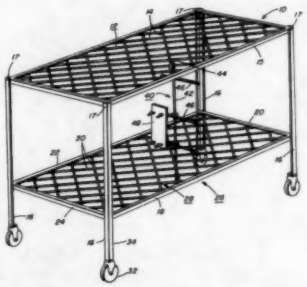
said light assembly component being elevatable out of said recess upon insertion of a tool through said access hole, thereby shifting said component from its interfering position to permit lateral disassembly of said casing and base.

4,408,265

LAMP, IN PARTICULAR FOR MOTOR VEHICLES

Heinz Dick, Odenthal, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 14, 1981, Ser. No. 254,026
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015693
Int. Cl.³ F21V 7/22
U.S. Cl. 362—238 **6 Claims**



1. A lamp assembly comprising:

a housing which includes a rear cover portion and a front lens element defining a plurality of light emitting areas;

a plurality of light emitting lamps mounted within said housing and correspondingly associated with a plurality of light emitting areas of said lens element; and

a light reflector element formed of an electrically conducting sheet material, subdivided into a plurality of electrically isolated areas for each defined light emitting area, wherein each subdivision provides separate electrical connection between an externally supplied voltage source and its associated lamp.

4,408,266

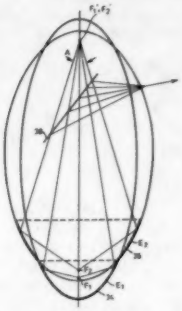
OPTICAL SYSTEM FOR AIRPORT SEMI-FLUSH APPROACH LIGHTS

Ermes Sclippa, R.R. #6, Guelph, Ontario, Canada (N1H 6J3)

Filed Apr. 9, 1981, Ser. No. 252,364
Int. Cl.³ F21V 7/08
U.S. Cl. 362—297 **3 Claims**

1. An optical system suited for an aircraft guidance lighting fixture, comprising a lamp, a reflector, a mirror and an exit prism, said lamp being of the high intensity incandescent type,

having an elongated filament of finite length, said lamp and said reflector being mounted in said fixture such that said reflector surrounds said lamp, said reflector having a plurality of ellipsoidal surface portions of differing eccentricities, such that the surface portions are axially displaced relative to each other to reflect light from said lamp in the same general direction, the major axes of each of the ellipsoidal surface portions being coincident and passing through the axis of said elongated



filament, a focus of each ellipsoidal surface portion being located on said filament and spaced apart equidistantly from each end of said filament, the ellipsoidal surface portion having the greatest eccentricity being located nearest the filament of said lamp, and the conjugate foci of said ellipsoidal surface portions being coincident in space said mirror lying on said major axes at an adjustable angle of substantially forty five degrees to said axes arranged to reflect light from said lamp through said prism and thus substantially at right angles to said major axes.

4,408,267

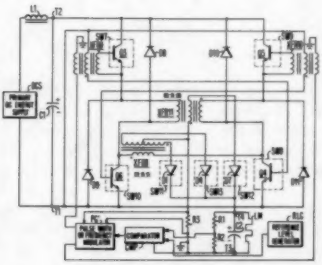
DC-TO-DC SWITCHING CONVERTERS

Duard L. Pruitt, Cinnaminson, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 223,495, Jan. 8, 1981, abandoned. This application Sep. 10, 1982, Ser. No. 416,704

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—17 **8 Claims**



1. A switching regulator for supplying a substantially non-pulsating flow of converted current comprising:

first and second terminals for connection of a primary energy source therebetween, the voltage from which source may range between low-voltage or high-voltage conditions;

third and fourth terminals for connection of load means therebetween;

switching control means for supplying first control signal pulses and second control signal pulses interleaved in time with said first control signal pulses, with substantial intervals between each of said first control pulses and the succeeding second control pulse and between each second control pulse and the succeeding first control pulse, at least under primary energy source conditions other than said low-voltage condition, the durations of said first and second control pulses as compared to the durations of intervals between them being controllable responsive to a feedback error signal;

a first transformer having first and second primary windings and a secondary winding;

a second transformer having a primary winding with first and second ends and at least a first secondary winding;

first switching means responsive to said first control signal pulses for selectively completing a connection of the first primary winding of said first transformer between said first terminal and the first end of the primary winding of said second transformer;

second switching means responsive to said second control signal pulses for selectively completing a connection of the second primary winding of said first transformer between said first terminal and the second end of the primary winding of said second transformer;

third switching means responsive to said first control signal pulses for selectively completing a connection between the second end of the primary winding of said second transformer and said second terminal;

fourth switching means responsive to said second control signal pulses for selectively completing a connection between the first end of the primary winding of said second transformer and said second terminal;

means for supplying converted currents, all of the same polarity, from the secondary windings of said first and second transformers to said load means, one of said first and second transformers being connected for providing current during the times said control pulses are supplied and the other being connected for providing flyback current during the substantial intervals between control pulses to maintain a substantially constant flow of converted current despite non-conduction of said first, second, third and fourth switching means;

means responsive to the sum of the converted currents flowing through said load means for developing a feedback signal; and

a comparator comparing said feedback signal to a reference level for developing said feedback error signal to complete a degenerative feedback loop for controlling the respective lengths of said control pulses and said substantial intervals between control pulses.

4,408,268

PULSE MODULATED ELECTRONIC VOLTAGE CONTROLLER WITH SMOOTH VOLTAGE OUTPUT

Philip H. Peters, Greenwich, and Abdallah M. Itani, Ballston Spa, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,651

Int. Cl.³ H02M *3/02, 5/02*

U.S. Cl. 363—62 **5 Claims**

1. A power conditioning circuit for coupling an alternating or direct current, two-wire, electrical power source to a load, said circuit comprising:

a common bus connected to a first side of said power source and to a first side of said load;

a power bus connected to the second side of said power source;

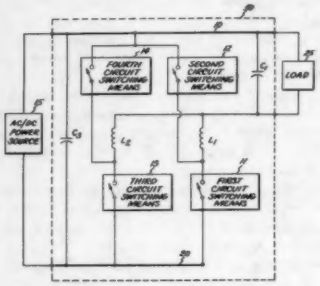
first inductive means having a first side connected to the second side of said load;

first circuit switching means connected between the second side of said first inductive means and said power bus, said first circuit switching means operating to repeatedly disconnect said first inductive means from said power bus, whenever said power source exhibits a first voltage polarity with respect to said power bus;

second circuit switching means connected between the second side of said first inductive means and said common bus, said second circuit switching means operating to connect said first inductive means in parallel with said load whenever said first conductive switching means operates to disconnect said first inductive means from said power bus;

second inductive means having a first side connected to the second side of said load;

third circuit switching means connected between the second side of said second inductive means and said power bus,



said third circuit switching means operating to repeatedly disconnect said second inductive means from said circuit power bus whenever said power source exhibits a voltage polarity opposite said first voltage polarity, with respect to said power bus; and

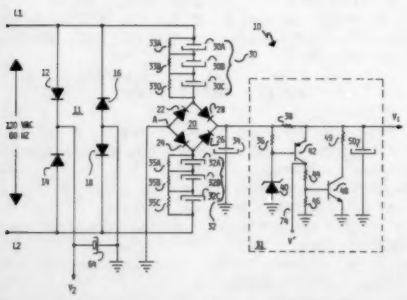
fourth circuit switching means connected between the second side of said second inductive means and said common bus, said fourth circuit switching means operating to connect said second inductive means in parallel with said load whenever said third circuit switching means operates to disconnect said second inductive means from said power bus.

4,408,269

BALANCED POWER SUPPLY WITH POLARIZED CAPACITORS

Philip J. Nowaczyk, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 18, 1982, Ser. No. 389,744
Int. Cl.³ H02M 7/06
U.S. Cl. 363—126 **13 Claims**



1. A power supply energized by an AC input voltage provided on first and second input lines for generating at least one DC output voltage, said power supply comprising:

first rectifying means having first and second input terminals, a ground terminal and an output terminal upon which a first DC output voltage is developed;

first and second polar capacitive means coupling said first and second input lines to the first and second input terminals of said first rectifying means, respectively, for limiting the voltage applied thereto; and

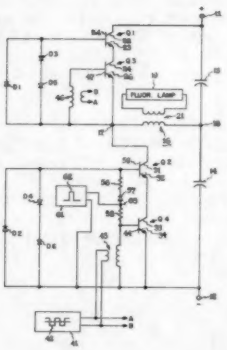
grounded conducting means coupled across said first and second input lines for providing a return current path for limiting the reverse voltage applied across said first and second polar capacitive means in preventing a voltage polarity reversal thereacross.

4,408,270

STORED CHARGE INVERTER CIRCUIT WITH RAPID SWITCHING

Thomas E. Anderson; Alvin A. Bush, and John Giorgis, Jr., all of South Euclid, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 16, 1981, Ser. No. 284,016
Int. Cl.³ H02M 7/537
U.S. Cl. 363—132 **17 Claims**



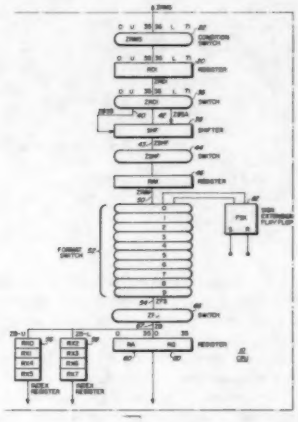
1. An inverter circuit for operating from a d-c power source and applying alternating current through a load which is inductive or has an inductive component, comprising first and second pairs of transistors connected to alternately apply current through said load from said power source, each said pair of transistors comprising first and second transistors having their collector-emitter paths connected in serires between an end of said load and a terminal of said d-c power source, a source of alternating control signal voltage connected in opposite phases to said first transistors to enable them to be sequentially conductive, said second transistors having the characteristic of storing a charge applied to their control electrodes, and said load having the characteristic of inducing a flyback current when current flow therein is terminated, means connected between said load and said control electrodes of the second transistors for applying the flyback current resulting from the turn-off of each of said first transistors through the base-collector path of the second transistor of the other pair thereof for causing it to operate as an inverted transistor and rendering it conductive and storing a charge therein to keep it conductive for a period of time, said circuit being devoid of any other source of repetitive turn-on pulses for said second transistors.

4,408,271

CIRCUIT FOR IMPLEMENTING A DIGITAL COMPUTER INSTRUCTION

Jerry L. Kindell, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 328, Jan. 2, 1979, abandoned.
This application Dec. 22, 1980, Ser. No. 219,196
The portion of the term of this patent subsequent to Feb. 10, 1998, has been disclaimed.
Int. Cl.³ G06F 5/00, 3/00
U.S. Cl. 364—200 5 Claims



1. In a central processor of a digital data processing system, circuit means for reformating a pure binary number comprising:

a data-in register adapted to have stored into it a first and a second word, with each word having 36 data bits, with the bits of each word being divided into 4 bytes of 9 data bits per byte, with each of the 4 bytes adapted to contain a character of the binary number, and with each character having 8 or 9 data bits; the number of characters of the binary number being in the range of from 1 to 4; the first word stored in the data-in register containing the most significant character of the binary number, which most significant character is stored in an identified one of the four byte positions of said first word; any other characters of the binary number being stored in contiguous byte locations of decreasing significance;

an intermediate register for storing 36 data bits;

shifting means connected to the data-in register and the intermediate register for shifting the words stored in the data-in register so that the byte of the first word containing the most significant character of the binary number is left justified;

means for storing the byte containing the most significant character and any other bytes containing characters of the binary number in the intermediate register, the byte containing the characters of the binary number being arranged contiguously in order of decreasing significance from left to right;

an addressable register of the central processor; and

format switch means connected to the intermediate register and the addressable register for reformating the 36 data bits stored in the intermediate register so that the data bits of the binary number are right justified and contiguous; and

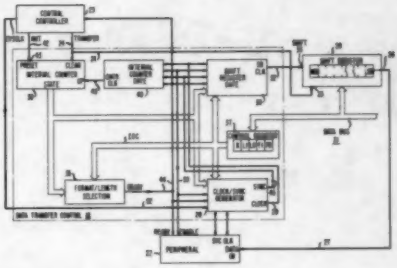
means for storing the binary number as reformated by the format switch means in the addressable register.

4,408,272

DATA CONTROL CIRCUIT

Stephen M. Walters, Aberdeen, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 3, 1980, Ser. No. 203,794
Int. Cl.³ G06F 3/04
U.S. Cl. 364—200 5 Claims



5. A data transfer circuit (18) arranged for transferring a data word in serial from a peripheral device (122) to a shift register (120) and in parallel from the shift register to a data bus (121); the transfer circuit including an interval counter (38); means (28) for applying clock pulses; a control register (37) for storing format data; the data transfer circuit characterized by:

first gate means (40) for controllably transmitting the clock pulses from the applying means to the interval counter;

second gate means (30) for controllably transmitting the clock pulses from the applying means to the shift register;

a selection circuit (35) responsive to the format data stored in the control register and to a first count state and subsequent sequential count states of the interval counter for producing a signal (READY) for fully conditioning the first gate means in preparation for transmitting the clock pulses to the interval counter and for partially conditioning the second gate means in preparation for transmitting the clock pulses to the shift register;

means (45) for supplying a synchronization signal to the fully conditioned first gate means for enabling the first gate means to transmit the clock pulses to the interval counter and for supplying the synchronization signal to the partially conditioned second gate means for fully conditioning the second gate means in preparation for transmitting the clock pulses to the shift register;

the fully conditioned second gate means being responsive to the format data and being enabled by a second count state and subsequent sequential count states of the interval counter for transmitting the clock pulses to the shift register, each clock pulse causing the shift register to shift in a bit of the data word in serial from the peripheral device;

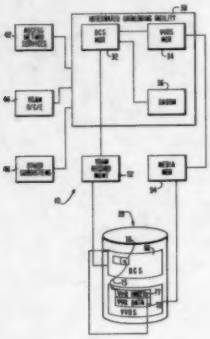
the selection circuit being responsive to the format data stored in the control register and to a third count state of the interval counter for inverting the signal (READY) and thereby disabling the first and second gate means from transmitting the clock pulses to the interval counter and to the shift register, respectively; and

means (124) for applying a signal (TRANSFER) to the shift register and to the interval counter for transferring the data word in parallel from the shift register onto the data bus and for resetting the interval counter.

4,408,273
METHOD AND MEANS FOR CATALOGING DATA SETS USING DUAL KEYED DATA SETS AND DIRECT POINTERS

Gregory M. Plow, Gilroy, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1980, Ser. No. 153,366
Int. Cl.[3] G06F *7/00*
U.S. Cl. 364—200 21 Claims



18. Apparatus for cataloging user data sets stored on a data volume to enable opening of a user data set by a central processor having access to the data volume and a main storage, said apparatus enabling opening of a user data set even though residing on a volume which, due to some external event, has been changed to cause loss of synchronization, the apparatus comprising:

means providing a volume data set for storing a plurality of volume records each containing identification information including at least one key field and extent information for user data sets recorded on the data volume;

base catalog means for storing a plurality of sphere records, each sphere record containing one or more key fields identifying a user data set and a direct address pointer to a corresponding volume record;

means for opening a first user data set having a key name by building, in the main storage, control blocks providing user data set identification and extent information, said means for opening including:

first means for searching said base catalog means for a first sphere record containing said key name in its key field;

second means responsive to the direct address pointer stored in said first sphere record for retrieving a first volume record;

third means for comparing said key name with a first key field of said first volume record;

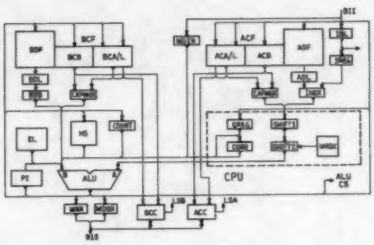
fourth means, responsive to a failure of correspondence between said key name and said first key field and thus indicative of a loss of synchronization, for searching said volume data set means for a second volume record containing a second key field corresponding to said key name, and for writing into said first sphere record a direct address pointer to said second volume record; and

means for retrieving information defining the extent of said first user data set from that one of said volume records which contains a key field corresponding to said key name.

4,408,274
MEMORY PROTECTION SYSTEM USING CAPABILITY REGISTERS

Nigel J. Wheatley, Broadstone, and Martyn P. Andrews, Taplow, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Sep. 29, 1980, Ser. No. 191,849
Claims priority, application United Kingdom, Sep. 29, 1979, 7933857
Int. Cl.[3] G06F *11/00*
U.S. Cl. 364—200 9 Claims



1. A data processing system including a processor module incorporating general purpose capability registers which are loaded with base, limit and access information relative to a resource segment under control of the steps of a load capability register instruction operating upon a capability pointer block particular to a process running in said processor module and referencing a system capability table common to all processes in said data processing system, characterized in that each of the general purpose capability registers is provided with a corresponding pointer register which is loaded with capability pointer information by said load capability register instruction derived from the capability pointer block for a process running in the processor module and each general purpose capability register includes a load on use indicator which is set when a corresponding pointer register associated with each respective general purpose capability register is loaded with said pointer information and the processor module includes means for automatically loading base, limit and access information identified by pointer information into an active one of said capability registers when said active capability register is used with the load on use indicator set, said access information comprising a plurality of access bits and said processor module further includes means for executing a load capability register masked instruction which comprises the step of masking out selected access bits of said access information to reduce permitted access rights established by said pointer information loaded in a corresponding pointer register associated with said active capability register.

4,408,275
DATA PROCESSING SYSTEM WITH DATA CROSS-BLOCK-DETECTION FEATURE

Kanji Kubo, Hadano, and Kenichi Wada, Zama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 221,325
Claims priority, application Japan, Dec. 26, 1979, 54-169657
Int. Cl.[3] G06F *11/30;* G11C *7/00*
U.S. Cl. 364—200 12 Claims

7. In a data processing system including main memory means for storing a plurality of instructions and data, and buffer memory means having a plurality of memory banks for storing a duplicate of a part of the contents of said main memory means in blocks each having a predetermined length, the improvement comprising:

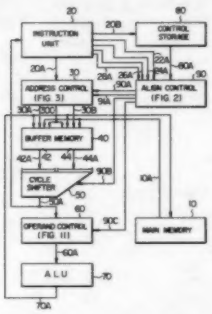
instruction means for indicating an address of data and a length indication of said data to execute an instruction,

said address data including a part indicating an address of a block and a part indicating an address within said block;

data length determining means responsive to said length indication from said instruction means for determining the length of the data to be fetched from said buffer means;

block-cross detecting means responsive to said address from said instruction means and said length information from said length determining means for detecting whether or not said data to be fetched from said buffer memory means with a single access is spread over a plurality of blocks; and

address means for supplying an address for fetching data to each of said plurality of memory banks of said buffer memory means on the basis of said address from said instruction means, said address means including a plurality



of address registers each for storing therein said address supplied to one of said plurality of memory banks, block address generating means for supplying a block address to said plurality of address registers on the basis of said address from said instruction means, and address-in-block generating means for supplying an address-in-block to said plurality of address registers on the basis of said address from said instruction means, said block address generating means including means for applying to one of said plurality of address registers an address of a block adjacent to a block indicated by said address from said instruction means in response to the detection of a block cross by said block-cross detecting means, and for applying the same address to all of said plurality of address registers in the absence of a detection of a block cross by said block-cross detecting means.

4,408,276

READ-OUT CONTROL SYSTEM FOR A CONTROL STORAGE DEVICE

Shinji Nishibe, Hachioji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 17, 1979, Ser. No. 85,596

Claims priority, application Japan, Oct. 24, 1978, 53-130052

Int. Cl.³ G06F *9/26*

U.S. Cl. 364—200 **7 Claims**

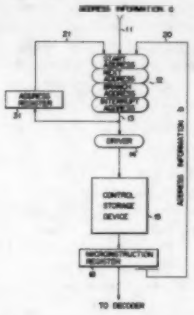
1. A read-out control system for use in a microprogram program-controlled data processor wherein microinstruction are singly supplied in successive machine cycles for execution by the data processor, the machine cycles being defined by a machine clock signal, the read-out control system comprising:

selector switch means for selectively outputting during a first machine cycle a start address, a next address, a branch address or an interrupt address;

control storage means connected to said selector switch means for storing microinstructions at a plurality of address locations and for outputting a said stored microinstruction from a said address location responsive to any one of said addresses outputted by said selector switch means;

microinstruction register means connected to said control storage means for receiving said microinstruction outputted from said control storage means; and

address register means directly coupled to said selector switch means for storing said address outputted by said selector switch means and for incrementing said address to form said next address in a time period sufficient to supply said next address as an input to said selector switch means at the next machine cycle, wherein a plurality of supplementary clock signals correspond to a single machine clock signal, the rising edge of the first of said plu-



rality of supplementary clock signals corresponding to a said machine clock cycle occurring simultaneously with the rising edge of said corresponding machine clock signal and the following edge of the last of said plurality of supplementary clock signals occurring simultaneously with the following edge of said corresponding machine clock signal, said address register means for storing said address outputted by said selector switch means during the first of said plurality of supplementary clock signals corresponding to said machine clock signal and for incrementing said address stored therein during the last of said plurality of supplementary clock signals corresponding to said machine clock signal.

4,408,277

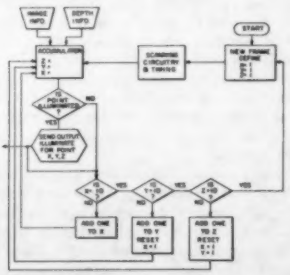
HOLOGRAPHIC IMAGER

Conrad Cortellini, Indianapolis, Ind.; Jeffrey S. Boone, Midland, Mich., and Richard D. Conard, Indianapolis, Ind., assignors to Moorfeed Corporation, Indianapolis, Ind.

Filed Aug. 6, 1980, Ser. No. 175,652

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—300 **2 Claims**


START
NEW FRAME DEFINE
SCANNING CIRCUITRY & TIMING
POINT ILLUMINATED
SEND OUTPUT ILLUMINATE FOR POINT X,Y,Z
ADD ONE TO X
ADD ONE TO Y RESET X=1
ADD ONE TO Z RESET X=1 Y=1

1. A method of decoding three-dimensional information addressable by three coordinates, comprising the steps of

(a) defining an origin point;
(b) analyzing the information content of the point and providing a corresponding output;
(c) determining whether t... last point analyzed is the last point along a first coordinate axis; if not, advancing to the next point along the first coordinate axis and returning to step b; if so, advancing to step d;
(d) determining whether the last point analyzed is the last point along a second coordinate axis perpendicular to the first; if not, advancing to the next point along the second coordinate axis, returning to the origin point along the first coordinate axis, and returning to step b; if so, advancing to step e; and
(e) determining whether the last point analyzed is the last point along a third coordinate axis perpendicular to the first and second coordinate axes; if not, advancing to the next point along the third coordinate axis, returning to the origin points along the first and second coordinate axes, and returning to step b; if so, returning to step a.

4,408,278

ELECTRIC CONTROL METHOD FOR AUTOMOBILE AIR CONDITIONER

Atsunori Saito; Masanori Naganoma, both of Kariya; Yasuhiro Iwata, Aichi, and Kiyoshi Usami, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

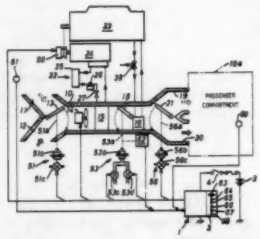
Continuation of Ser. No. 199,920, Oct. 23, 1980, Pat. No. 4,316,251, which is a continuation of Ser. No. 79,260, Sep. 27, 1979, abandoned. This application Nov. 23, 1981, Ser. No. 324,002

Claims priority, application Japan, Oct. 2, 1978, 53-121855

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ G06F *15/20*; B60H *3/00*

U.S. Cl. 364—424 **7 Claims**



7. An electric control apparatus for an automobile air conditioner including:
an air duct for allowing the flow of air into a passenger compartment of the automobile;
air flow temperature control means for selectively cooling and/or warming the air flowing through said air duct to adjust the temperature of air discharged into said compartment from said air conditioner;
a switch door arranged within said air duct for discharging the conditioned air into the lower portion of said compartment at its first position and for discharging the conditioned air into the upper portion of said compartment at its second position;
an electrically operated mechanism for switching-over said switch door to the second position from the first position upon energization of said mechanism and for switching-over said switch door to the first position from the second position upon deenergization of said mechanism, the energization of said mechanism being conducted when the adjusted temperature of air discharged from said air conditioner is lower than a predetermined value, and the deenergization of said mechanism being conducted when the temperature of air discharged from said air conditioner is higher than the predetermined value;
means for compensating the predetermined value in relation to changes of the actual in-car temperature and the actual temperature outside the automobile;
means for producing first and second output signals respectively when the adjusted temperature of air is lower than the compensated value and is higher than the compensated value; and
means for selectively conducting energization and deenergization of said electrically operated mechanism in response to the first and second output signals.

4,408,279

METHOD AND APPARATUS FOR ADJUSTING THE SUPPLY OF FUEL TO AN INTERNAL COMBUSTION ENGINE FOR AN ACCELERATION CONDITION

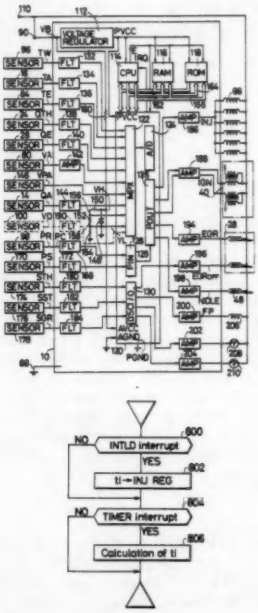
Masumi Imai, and Kotaro Hirasawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1979, Ser. No. 73,085

Claims priority, application Japan, Sep. 6, 1978, 53-108608

Int. Cl.³ F02M *51/00*; F02B *3/02*; G06F *15/20*

U.S. Cl. 364—431.05 **18 Claims**



7. A method of operating a processor-controlled apparatus for controlling the supply of fuel to an internal combustion engine, said apparatus having sensor means for producing signals representative of operating conditions of the engine, actuator means for controlling the supply of fuel to said engine in response to fuel supply control signals applied thereto, and an input/output unit coupled to receive signals produced by said sensor means and to deliver fuel supply control signals to said actuator means, said processor being coupled to said input-/output unit, for carrying out engine control data procesing operations including fuel supply control calculations in accordance with signals produced by said sensor means and thereby generating engine control data that are coupled to said input-/output unit, said input/output unit including first means for

generating an engine control timing signal pattern through which operational events of said engine are controlled, second means for storing said engine control data, third means, coupled to said first means, for generating respective engine timing codes the values of which are selectively modified by said engine control timing pattern, fourth means, coupled to said second and third means, for comparing respective ones of said engine control data with respective ones of said engine timing codes and producing respective output signals when said respective engine control data define a prescribed relationship with respect to said engine timing codes, and fifth means, coupled to said fourth means, for producing a control signal to be coupled to said actuator means in response to an output signal produced by said fourth mean, and wherein said second means includes means for storing engine control data representative of the duration of the supply of fuel to said engine, and said sensor means include means for generating timing pulses in accordance with the rotation of the engine crankshaft, said timing signal pattern being produced independently of said timing pulses generated by said sensor means;

said method comprising the steps of:

(a) in response to one of the timing signals of said engine control timing signal pattern, generating a first interrupt signal and thereby causing said processor to execute a first program for carrying out said fuel supply control calculations and generating engine control data; and

(b) in response to the generation of timing pulses by said sensor means, generating a second interrupt signal and thereby causing said processor to execute a second program, independent of said first program, by way of which said processor supplies said engine control data representative of the duration of the supply of fuel to said engine; and

whereby the periodic generation of data to be supplied to said second means is assured irrespective of the speed of rotation of the engine crankshaft.

4,408,280

ADAPTIVE NUMERICAL CONTROL APPARATUS FOR MACHINE TOOLS

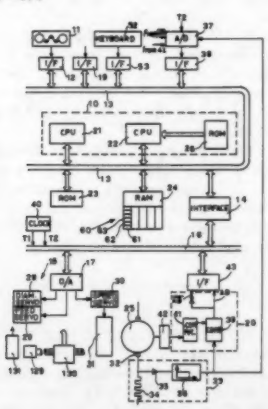
Raffaele Bedini, Pisa; Luciano Lauro, Pavone, and Pier C. Pinotti, Pontremoli, all of Italy, assignors to Olivetti Controllo Numerico S.p.A., Marcianise, Italy

Filed Oct. 8, 1980, Ser. No. 195,087

Claims priority, application Italy, Oct. 11, 1979, 68981 A/79

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—474 **5 Claims**



1. An adaptive numerical control system for a lathe, comprising a cutting tool having optimum cutting conditions when cutting at a predetermined cutting speed and at a predetermined feed rate, a direct-current electric motor operable for rotating a workpiece spindle at a number of revolutions per-unit-time corresponding to an actual cutting speed, said motor having an armature circuit absorbing an electric current proportional to power supplied by the motor, said motor having a predetermined characteristic revolution number defining the optimum working conditions for the motor when the motor operates at the maximum torque and at the maximum power corresponding to a maximum current that said armature circuit can absorb, moving means for moving said tool at the actual feed rate with respect to the workpiece spindle, memory means for storing a machining program, a control unit for executing the machining program stored in said memory means to command said moving means and said motor, recording means for recording a machine technological range around said optimum cutting conditions, said range being defined by maximum and minimum feed rate of said tool, maximum and minimum number of revolutions per-unit-time of said motor and maximum and minimum feed per revolution, said range including said optimum working conditions, said recording means also recording said maximum current and said characteristic revolution number, means for sensing said moving means to indicate the actual feed rate, a tachometer for indicating the number of revolutions per-unit-time of said motor,

a shunt arranged in series with said armature circuit,

shunt sensing means for sensing said shunt to indicate the current flowing in said armature circuit, timing means for defining an optimization cycle, comparison means controlled by said timing means for cyclically effecting a comparison of the actual feed rate indicated by said means for sensing the moving means and the number of revolutions per-unit-time indicated by said tachometer with said range to condition said control unit to command an operation of said moving means and of said motor to first bring the actual feed rate and number of revolutions per-unit-time within said range,

said comparison means being effective when said actual feed rate and number of revolutions per-unit-time are within said range for effecting a comparison of the current indicated by said shunt sensing means and the number of revolutions per-unit-time indicated by said tachometer with said recorded maximum current and characteristic number of revolutions respectively to condition said control unit to command an operation of said moving means and said motor to bring said actual feed rate and said number of revolutions per-unit-time toward said optimum working conditions.

4,408,281

CONTROL SYSTEM FOR SYNCHRONIZING MULTIPLE PRESSES IN A LINE

Carl E. Tack, Jr., Glen Ellyn, and Francis E. Heiberger, Elmhurst, both of Ill., assignors to Danly Machine Corporation, Chicago, Ill.

Filed Jul. 27, 1981, Ser. No. 287,536

Int. Cl.³ H02P *5/50*; C03B *9/40*

U.S. Cl. 364—476 **19 Claims**

1. A control system for a press line containing a plurality of presses for performing successive operations on the same workpiece, said control system comprising

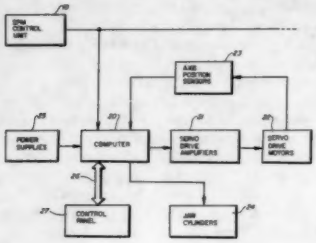
a plurality of computer control units each of which controls the movement of one of said presses and the workpiece transfer mechanisms associated therewith,

means for producing a timing signal representing the desired time period for one complete cycle of each press in the line, each of said computer control units being responsive to said timing signal for controlling the associated press and transfer mechanisms to complete each press cycle within said desired time period,

means within each of said computer control units for producing a synchronizing signal at a predetermined point in said desired time period for each successive press cycle,

means responsive to (1) the synchronizing signal from one of said computer control units selected as a reference unit

and (2) the synchronizing signals from each of the other computer control units, and producing sync error signals indicating whether each of said other control units is lagging or leading the reference unit, and



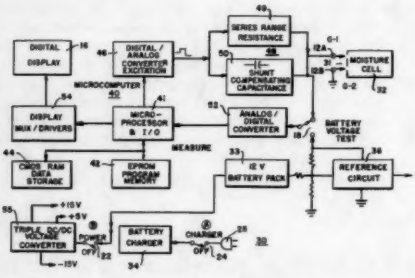
means responsive to each of said sync error signals for increasing or decreasing the desired time periods for the respective control units according to whether each unit is leading or lagging the reference unit.

4,408,282

AC RESISTANCE MEASURING INSTRUMENT

Peter J. Hof, Richland, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 22, 1981, Ser. No. 256,372
Int. Cl.³ G01R *27/00*
U.S. Cl. 364—482 **16 Claims**



1. An instrument for measuring the impedance of an electrical device through a transmission line having one end connected to said electrical device and the other end connected to said instrument comprising:

signal generating means for generating an excitation signal having a particular wave shape;

compensation circuit means for compensating for the capacitance of the transmission line coupled between said signal generating means and said other end of the transmission line, said compensation circuit means, the transmission line, and said electrical device being responsive to said excitation signal to develop an output signal at the other end of the transmission line corresponding to the voltage across the transmission line and said electrical device; and

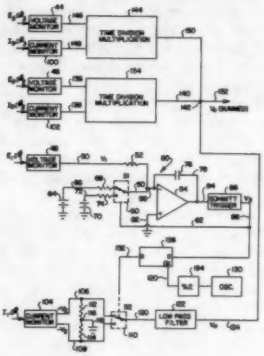
signal processing means coupled to said other end of the transmission line for sampling said output signal and comparing the wave shape of the said signal with said particular wave shape, said signal processing means further being connected to said compensation circuit means and acting to control the impedance of said compensation circuit means to bring the wave shape of the output signal within a preselected correspondence with said particular wave shape wherein the output signal is indicative of the impedance of the transmission line and the device.

4,408,283

TIME DIVISION MULTIPLIER TRANSDUCER WITH DIGITALLY DERIVED PHASE SHIFT ADJUSTMENT FOR REACTIVE POWER AND ENERGY MEASUREMENT

Donald P. Kovalchik, Galloway, and Frank E. Battocletti, Columbus, both of Ohio, assignors to TransData, Inc., Dublin, Ohio

Filed Jun. 8, 1981, Ser. No. 271,375
Int. Cl.³ G01R *21/06*
U.S. Cl. 364—483 **39 Claims**



1. Power and energy evaluating apparatus, comprising:

first monitoring means for providing a first signal corresponding with a first monitored electrical parameter;

second monitoring means for providing a second signal corresponding with a second monitored electrical parameter;

time division converter means responsive to said first signal for deriving a pulse width modulated pulse train signal corresponding therewith at an output;

filter means means for selectively receiving said second signal for deriving a product categorized power evaluating signal;

N position digital circuit means having an input coupled with said time division converter output and responsive to clock inputs at sampling frequency, f_c, for substantially replicating said pulse width modulated pulse train signal continuously at an output thereof to effect a select time delay of said pulse train;

oscillator means having an output coupled with said digital circuit means for generating said clock inputs; and

switching circuit means coupled with said second monitoring means and to said digital circuit means output and actuable in response to said replicated pulse train signal to effect the application of said second signal to said filter means.

4,408,284

SIGNAL PROCESSING SYSTEM

Michael M. Kijesky, Reston, Va., and Charles T. Bogle, Doylestown, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 19, 1981, Ser. No. 227,025
Int. Cl.³ G06F *7/38*
U.S. Cl. 364—485 **11 Claims**

1. A system for detecting the presence of a desired signal frequency in a multi-signal environment, comprising:

spectrum analyzer means adapted to sample the multi-signal

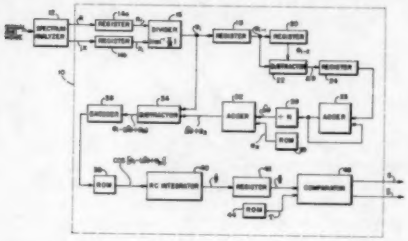
environment for providing digital information indicative of real and imaginary magnitude components of the desired signal frequency;

phase determinator means connected to receive the digital information from said spectrum analyzer means for producing a first digital signal indicative of the instantaneous phase of the desired signal frequency;

phase precession means connected to said phase determinator means for producing a second digital signal representative of a statistical estimate of phase variation of the desired signal frequency;

a first fixed storage device adapted to provide a plurality of third digital signals representative of distinct phase reference values between 0° and 360°;

an adder connected to said phase precession means and said



first fixed storage device for summing the second digital signal with each of the plurality of third digital signals thereby producing a plurality of fourth digital signals representative of revised phase reference values;

cosine integrator means connected to said phase determinator means and said adder for producing a plurality of fifth digital signals representative of relative signal strength for each of the phase reference values;

a second fixed storage device adapted to provide a sixth digital signal representative of a threshold signal value; and

a comparator connected to said cosine integrator means and said second fixed storage device for indicating the presence of the desired signal frequency when any of the plurality of fifth digital signals exceeds the sixth digital signal.

4,408,285

VIBRATION ANALYZING APPARATUS AND METHOD

Edwin D. Sisson, Worthington; Robert S. Morrow, Dubin; Donn V. Stoutenburg, Westerville, and Dean T. Davis, Columbus, all of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Feb. 2, 1981, Ser. No. 230,660
Int. Cl.³ G01M *7/00*
U.S. Cl. 364—508 **47 Claims**

1. Apparatus for use in carrying out vibration analysis of a variety operable in conjunction with transducers having a vibration responsive output, comprising:

conditioning means for selectively treating said vibration responsive output in accordance with a select vibrational parameter to provide a parameter related signal;

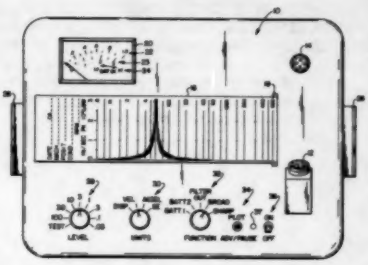
filter means selectively responsive to said parameter related signal, tunable over a predetermined range of frequencies in response to stepped inputs applied thereto in numbers of n steps per selected bandwidth for providing corresponding filtered output signals;

analog-to-digital converter means selectively responsive to said filtered output signals for deriving digital characterized signals corresponding therewith;

printer means responsive to print signals for generating a printout of data indicative of amplitude values corresponding with each one of said n steps and said filter output signals;

level switch means having a plurality of orientation responsive electible output conditions, each corresponding with a predetermined scale factor for said vibration responsive output; and

control means responsive to said analog-to-digital converter means digital characterized signals, including processor means having memory means for effecting the deviation



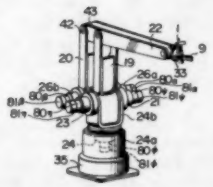
of said stepped inputs in correspondence with each of said n steps, said processor means deriving said print signals for effecting a said printer means printout of a frequency labeled, graphically represented pattern corresponding with said selected parameter, said processor means being responsive to an elected said level switch means output condition for effecting a said printer means printout of said pattern in combination with an amplitude scale pattern corresponding with said scale factor.

4,408,286

METHOD AND APPARATUS OF ROBOT TEACHING

Hiroshi Kikuchi, Hiratsuka, and Koichi Sugimoto, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 11, 1980, Ser. No. 215,333
Claims priority, application Japan, Dec. 14, 1979, 54-161557
Int. Cl.³ G05B *19/42*
U.S. Cl. 364—513 **15 Claims**



1. A teaching method for directly teaching a robot its operation, comprising the steps of:

manually moving an operating portion of a force sensor attached to a wrist, that is movably coupled with a distal end of an arm of a robot that is movable in a plurality of directions, into a predetermined teaching position;

computing a plurality of speed command value signals for moving said distal end of said arm of robot in a plurality of directions, said computation converting the signal produced by said force sensor into force components in a movement of the robot's arm, subtracting moving speed component of the robot's arm from said force components converted, and integrating the result of the subtraction with time;

driving drive means on the basis of said speed command

value signals computed to guide a position of said distal end of said arm; and

storing guiding data, in the form of positional information detected during said driving of the drive means, in memory means.

4,408,287

AUTOMATIC-SEARCH MICROFICHE READER INVOLVING THE USE OF A MICROCOMPUTER

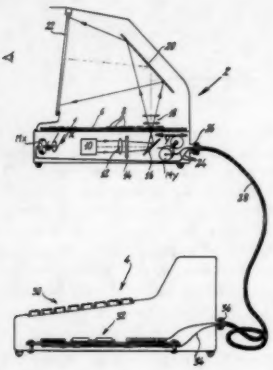
Daniel Parisot, and Dominique Mariaulle, both of 131, Avenue Foch, Residence Les Platanes, F-78400 Chatou, France

Filed May 22, 1981, Ser. No. 266,345

Claims priority, application France, May 23, 1980, 80 11540

Int. Cl.[3] G03B *23/08;* G06F *15/02*

U.S. Cl. 364—518 8 Claims



1. An automatic-search microfiche reader, comprising

a projector including a support plate for a plurality of microfiches and movable along an X-axis and a Y-axis perpendicular to the X-axis, projection means associated to said support plate, and driving means for moving said support plate along the X-axis and the Y-axis so as to place a particular microfiche relative to said projector means;

a control console associated to said projector, said control console including a keyboard having a first group of displacement keys, each of said keys being provided with a literal reference symbol corresponding to a displacement of said support plate along the X-axis and with a digital reference symbol corresponding to a displacement of said support plate along the Y-axis, and a second group of keys, each of which represents additional function keys; and

means for controlling said driving means and including an emitter associated to said keyboard for delivering coded radiation corresponding to each actuated key, means for detecting the coded radiation and delivering a corresponding coded electrical signal, a microcomputer receiving the coded electrical signal and being programmed so that in respect of each controlled operation obtained by a double action on said displacement keys a first code received corresponds to the displacement along the X-axis and a second code received corresponds to the displacement along the Y-axis, thereby decoding the coded electrical signal and generating corresponding control signals, and interface means receiving the control signals delivered by said microcomputer for controlling said driving means.

4,408,288

DISTANCE MEASURING ARRANGEMENT

Takashi Kondo, Izumi, and Nobuo Hashimoto, Ashiya, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

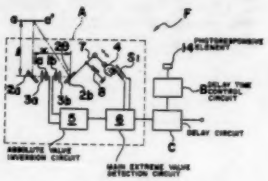
Continuation of Ser. No. 76,954, Sep. 19, 1979, Pat. No. 4,303,981. This application Mar. 6, 1981, Ser. No. 241,232

Claims priority, application Japan, Sep. 19, 1978, 53-115255

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.[3] G03B *7/08*

U.S. Cl. 364—525 2 Claims



1. An arrangement for use in a camera with an automatic focus control system, said arrangement comprising:

a pair of photoresponsive means which are arranged to each respectively receive an optical image of a target area and to generate an output corresponding thereto, each of said outputs having a delay in response to low illuminance conditions;

an optical means for varying the time relationship between said respective optical images on said pair of photoresponsive means;

a means for generating a coincidence signal when said outputs of said pair of photoresponsive means coincide with each other;

a means for detecting the average intensity of illuminance of said target area; and

a means for generating a delayed signal which is delayed from the time of the generation of said coincidence signal by an amount of time having a relationship to said average intensity of illuminance of said target area, wherein said automatic focus control system effects automatic focus control in accordance with said delayed signal.

4,408,289

SIMPLIFIED MONITORING APPARATUS FOR SENSORS IN MOTOR VEHICLES

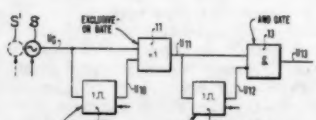
Bernward Boning, Ludwigsburg; Rainer Bone, Vaihingen; Rudolf Nagel, Asperg, and Jens-Detlef Rubrecht, Braunschweig, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 218,343

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006599

Int. Cl.[3] H03K *5/20*

U.S. Cl. 364—551 8 Claims



1. Apparatus for generating an output signal (U_{13}) indicative of malfunction of a signal generator (S, S') which, under nor-

mal operating conditions, generates a sequence of periodically repetitive input signals having a leading edge, and a signal width varying inversely with frequency, comprising

an exclusive OR gate (11);

a first monostable multivibrator (10) having an ON time corresponding to the signal duration of any one of the input signals under normal operation, and providing a time reference signal (U_{10});

a second monostable multivibrator (12) having an ON time corresponding to the permitted variation from normal operation to the signal duration of any one of the input signals;

and a coincidence gate (AND 13);

wherein the input signals from the signal generator (S,S') are connected to the frist monostable multivibrator (10) to trigger said multivibrator and to provide said time reference signals;

the input signals and the time reference signals are connected to the exclusive-OR gate (11) to provide compared output signals (U11) having a time duration representative of the deviation of the input signals (U_G) from the time reference signals (U_{10});

said compared time reference signals are connected to trigger the second monostable multivibrator (12), said second monostable multivibrator providing deviation output signals (U_{12}) having a leading edge corresponding to the leading edge of the time reference signals and a time duration as determined by said permitted variation;

and wherein the deviation output signals (U_{12}) and compared output signals (U_{11}) are connected to said coincidence gate (13) for comparison if the compared output signals have a time duration falling below, or above the time duration of the deviation output signals from the second monostable multivibrator (12),

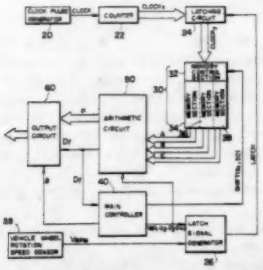
said coincidence gate providing an output indicative of proper operation if the comparison indicates that the time duration of the compared output signals (U_{11}) is less than that of the deviation output signals (U_{12}) while providing an output indicative of malfunction or improper operation if the compared output signals (U_{11}) are equal to or longer than said deviation output signals (U_{12}).

4,408,290

METHOD AND DEVICE FOR DETERMINING ACCELERATION AND/OR DECELERATION OF A MOVING OBJECT

Jun Kubo, Hino, and Minoru Honda, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 9, 1981, Ser. No. 223,845
Claims priority, application Japan, Jan. 14, 1980, 55-2143
Int. Cl.³ G06F *15/20*; G01P *3/42*
U.S. Cl. 364—566 **28 Claims**



1. A device for determining the acceleration or deceleration of an object comprising:

a speed sensor for determining the speed of the object and producing a sensor signal in the form a train of pulses, each of a period corresponding to the determined speed of the object;

a clock signal generator for producing a train of clock pulses of a constant frequency;

a counter means for counting the clock pulses and for latching the counted value after a selected number of sensor signal pulses have been received;

a memory means for storing the latched counter values, wherein said memory means renews at least one of the stored values each cycle of device operation in a selected shifting mode;

an arithmetic means for processing the stored values in said memory means and determining the acceleration or deceleration of the object on the basis of any difference between the stored values in said memory means, said arithmetic means producing a command for increasing the number of pulses of the sensor signal over which the clock pulses are to be measured when the difference between the stored value is less than a predetermined value; and

a controller means responsive to said command to determine the number of pulses of the sensor signal over which the clock pulses are measured for a succeeding cycle of device operation, said controller being operative for determining the shifting mode for the values stored in the memory means on the basis of the selected number of pulses, said controller means producing a latch signal for causing said counter means to latch the counted value and a shift control signal for controlling the shifting operation of said memory means.

4,408,291

POINT-OF-MANUFACTURE DATA ACQUISITION SYSTEM

Guy W. Gunzberg, Buffalo, and Lawrence G. Lippman, Clarence Center, both of N.Y., assignors to M. Wile & Company, Inc., Buffalo, N.Y.

Continuation of Ser. No. 48,704, Jun. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 947,720, Oct. 2, 1978, abandoned. This application Jun. 3, 1981, Ser. No. 270,003
Int. Cl.³ G06F *1/00, 15/46*
U.S. Cl. 364—900 **44 Claims**

1. A point-of-manufacture data acquisition system for a production facility of the kind comprising a series of work stations through which a multiplicity of workpiece units are transferred for performance of a sequence of production operations, for collecting and recording data for each station, on a real-time basis, representative of operator identity and time present, and workpiece unit identity and time of processing, the system comprising:

a multiplicity of workpiece unit identification members each bearing scannable data identifying an associated workpiece unit;

a plurality of operator identification members, each bearing scannable data identifying an operator;

a series of data terminals, one for each work station, each data terminal comprising scanning means at the work station for scanning the data on the identification members, and recording/transmitting means including work station identification means and data storage means for storing the data from each identification member scan;

polling processor means, for repetitively polling the recording/transmitting means of all of the data terminals for data stored therein, the polling processor means including means for recording that data;

transmission means, comprising only two transmission lines connected to all of the data terminals;

a central power supply;

and terminal bus interface means connecting the polling processor means and the central power supply to the transmission means to transmit power continuously from the central power supply to all of the data terminals on a synchronous time-share basis with the transmission of digital information data signals from the data terminals to the polling processor and of digital interrogation and verification data signals from the polling processor to the data terminals;

the system providing complete compilation of the aforesaid data requirements in response to scanning of the identification members, with no additional inputs.

4,408,292

DATA PRINT CONTROL IN AN ELECTRONIC CASH REGISTER

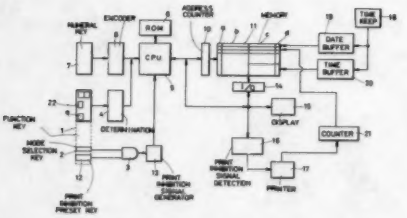
Hiroshi Nakatani, Yamatokoriyama, and Hachizou Yamamoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 18, 1980, Ser. No. 188,564

Claims priority, application Japan, Sep. 27, 1979, 54-124858; Sep. 27, 1979, 54-124859; Sep. 27, 1979, 54-124860

Int. Cl.[3] **G06F** *15/20, 15/22*

U.S. Cl. 364—405 **1 Claim**



1. A data print control system in an electronic cash register comprising:

a printer system for printing said data;

memory means having locations defined by a location address, said locations each having a first memory section for storing information data therein and a second memory section for storing a code signal instructing said printing system as to whether a printing operation should or should not be performed with respect to said information data, said memory means locations each including a plurality of said first and second memory sections for storing different types of said information data and corresponding code signals for each of said types, said code signals instructing said printer system whether or not to print information data stored in said memory means at the location address selected by said first key input means;

time information generation means for generating date information and time information; said date and time information comprising information data for storage in said first memory section;

counter means operatively associated with said printer system for incrementing a receipt serial number stored therein, said receipt serial number comprising information data for storage in said first memory section;

means for introducing said information data into the first memory sections of said locations;

first key input means for selecting one of said location addresses;

control means for addressing the second memory section at said memory location address selected by said first key input means; and

print preset key means for introducing a code signal into the second memory section corresponding to said selected location address, said print preset key means developing a high level logic signal when the information data stored in the first memory section at the selected one of said location addresses is not required to be printed, whereby a high level logic code signal is stored in said second memory section associated with said selected location address;

detection means for reading said code signals and selectively transferring said types of information data stored in said first memory sections to said printer for printing in accordance with the logic levels of the respective code signals, said detection means functioning to prevent the transferring of said information data stored in the first memory section when the associated second memory section has a high level logic signal stored therein;

said first and second memory sections at each location occupying adjacent bits in memory, said second memory section occupying the last bit at each address.

4,408,293

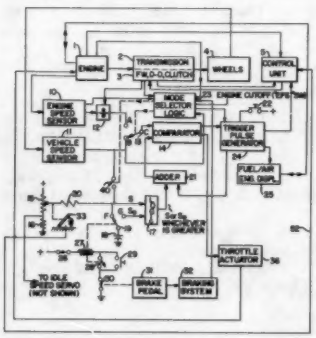
AUTOMOTIVE CONTROL SYSTEMS FOR IMPROVING FUEL CONSUMPTION

Jack Avins, 178 Herrontown Rd., Princeton, N.J. 08540

Filed Dec. 4, 1980, Ser. No. 212,852

Int. Cl.[3] **G05D** *13/64;* **B60K** *31/00*

U.S. Cl. 364—426 **1 Claim**



1. In a motor vehicle of the type employing an internal combustion engine coupled to a transmission system with one or more states for driving the wheels of said vehicle to achieve a speed according to the displacement of an accelerator pedal, said pedal controlling the engine via a throttle, said vehicle including a braking system for slowing the vehicle, the combination therewith of an automotive system for improving fuel efficiency, comprising:

engine speed sensor means for providing an output indicative of engine speed;

vehicle speed sensor means for providing an output indicative of vehicle speed;

means coupled to said accelerator pedal for providing an output control signal indicative of the magnitude of pedal actuation;

comparison means operative in a first mode to compare said control signal with said engine speed and operative in a

second mode to compare said control signal with said vehicle speed for providing a comparison output signal indicative of any difference between said engine or vehicle speed as compared to said output control signal indicative of pedal actuation;

control means coupled to said engine and responsive to said comparison output signal to control the speed of said engine in said first mode, and to control the speed of said vehicle in a second mode, and

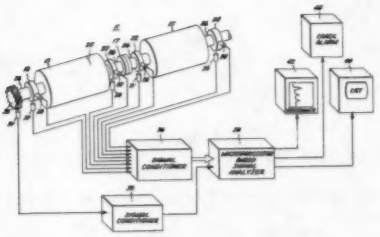
mode selector logic coupled to said engine speed sensor means, said vehicle speed sensor means and said transmission system for automatically operating said comparison means in either said first or second modes to thereby automatically provide either engine speed or vehicle speed control.

4,408,294

METHOD FOR ON-LINE DETECTION OF INCIPIENT CRACKS IN TURBINE-GENERATOR ROTORS

Imdad Imam, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,571
Int. Cl.³ G01M 7/00
U.S. Cl. 364—508 **7 Claims**



1. A method for detecting incipient cracks in the rotor of a turbine-generator while the turbine-generator is in operation at running speed, comprising the steps of:

(a) sensing mechanical vibrations of the rotor at at least one location thereof to produce at least one time-dependent vibration signal;

(b) providing at least one enhanced background vibration signal prior to development of a crack in the rotor, said signal being obtained and processed by

(b1) collecting an integral number of time segments of said vibration signal, each time segment corresponding to one revolution of the rotor;

(b2) generating said enhanced background signal by summing together all such collected time segments of said vibration signal by superposing each on the other;

(b3) storing said enhanced background signal;

(c) providing at least one enhanced foreground signal by

(c1) collecting an integral number of time segments of said vibration signal equal to the number collected in (b1), each time segment corresponding to one revolution of the rotor;

(c2) generating said enhanced foreground signal by summing together all such collected time segments of said vibration signal by superposing each on the other;

(d) providing a difference signal by subtracting said enhanced background signal from said enhanced foreground signal by superposing one on the other; and

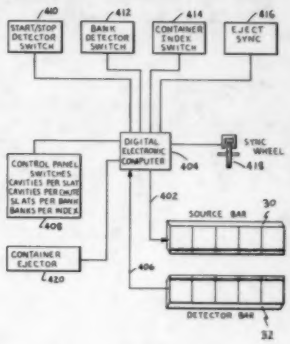
(e) determining the spectral content of said difference signal, the presence and relative amplitude of higher harmonics of the running speed being indicative of the presence and size of a rotor crack.

4,408,295

OPTICAL INSPECTOR FOR SLAT-TYPE CONTAINER FILLING MACHINE

William T. Kavage, and Marvin E. Monroe, both of Sunbury, Ohio, assignors to Optek, Inc., Galena, Ohio

Filed Nov. 28, 1980, Ser. No. 211,211
Int. Cl.³ G06F 15/20; B65B 57/10, 57/18
U.S. Cl. 364—552 **19 Claims**



1. An apparatus for detecting the presence and absence of objects in an array of predetermined object positions said apparatus comprising:

(a) A cooperating radiation device means for directing electromagnetic energy toward said array and a radiation detector means for receiving said electromagnetic energy which is incident upon said object position under only one of the two possible conditions which are an object being present and being absent and for not receiving said energy under the other condition, a first one of said cooperating means comprising individually addressable discrete devices spaced along said array, there being at least twice as many of said discrete devices as there are possible object positions;

(b) digital addressing circuit means connected to said discrete devices for sequentially actuating said discrete devices;

(c) circuit means connected to and for actuating the second one of said cooperating means during the actuation of said discrete devices;

(d) data storage circuit means connected to said addressing circuit means and the radiation detector means for storing data representing the presence or absence of received radiation during actuation of each of said discrete devices; and

(e) electronic data processing means for storing the addresses of discrete devices representing the approximate object positions in said array and for comparing the data for each of said object position addresses to the desired data for each of said object position addresses and providing an output in the event they are not identical.

12. A method for detecting the presence and absence of objects in an array of predetermined object positions, using a plurality of discrete light sources and detectors, said method comprising:

(a) positioning at least twice as many of said light sources as there are object positions at spaced intervals along said object positions;

(b) radiating light upon said object positions in time sequence from said light sources;

(c) detecting, each time a source is actuated, the presence or absence of light transmitted through said object positions and electronically storing a signal indicating said presence or absence; and

(d) selecting the light source positions nearest to each object

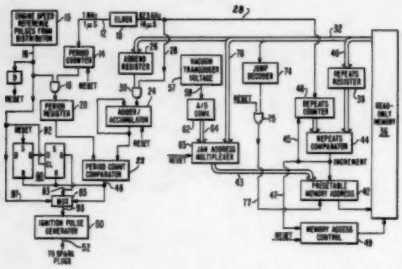
position and storing the presence-absence signal corresponding to the selected positions.

4,408,296

DIGITAL TIMING SYSTEM FOR SPARK ADVANCE

Anthony D. Robbi, Hopewell, and Joseph O. Sinniger, Pennington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 27, 1980, Ser. No. 181,941
Int. Cl.³ F02P 5/14; G06M 3/02
U.S. Cl. 364—569 **7 Claims**



1. A system for producing an output pulse at a time which is a function of the spacing of two time spaced input pulses comprising, in combination:

first means producing time spaced clock pulses;

second means receptive of said clock pulses and said two time spaced input pulses for determining the time period between said two time spaced input pulses and for storing a signal whose value corresponds to said time period;

a memory having at least two groups of addressable locations, a first group of which stores a first group of addend and repeats numbers in successive locations thereof, a second group of which stores a second group of addend and repeats numbers in successive locations thereof, said memory including a memory address counter;

third means dependent on a sensed condition to jam into said memory address counter the address of a first location of one of said at least two groups of locations, said first location address being dependent on the value of the sensed condition;

fourth means operative after said signal is stored in said second means for changing the addresses in said memory address counter for reading out in succession addend and repeats numbers of the group thereof, the address of the first location of which was jammed into said memory address counter;

fifth means for accumulating each said readout addend number a number of times determined by its corresponding repeats number at a rate which is a function of the spacing of said clock pulses; and

sixth means producing an output pulse when the value accumulated in said fifth means corresponds with said value in said second means.

4,408,297

REDUCTION IN MAXIMUM TIME UNCERTAINTY OF PAIRED TIME SIGNALS

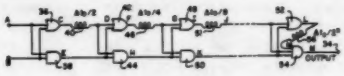
George E. Theodosiou, West Chicago, and John W. Dawson, Clarendon Hills, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Feb. 11, 1981, Ser. No. 233,533
Int. Cl.³ G01T 1/20
U.S. Cl. 364—569 **10 Claims**

1. An apparatus for reducing the maximum time uncertainty Δt_o of a series of paired time signals representative of a series of single events, the series of paired signals varying at two terminals within a predetermined limit of $t_{max}-t_{min}$ with $t_{max}-t_{min}$ being equal to Δt_o, each pair of signals having a first signal t_1 and a second signal t_2 in order of time with $t_1 \leqq t_2$ and t_1+t_2 being equal to a constant, the apparatus comprising:

input means including the two terminals for providing the series of paired signals t_1 and t_2 with t_1 and t_2 varying between the terminals,

output means, and



circuit means interconnecting the input terminals to the output means, the circuit means including:

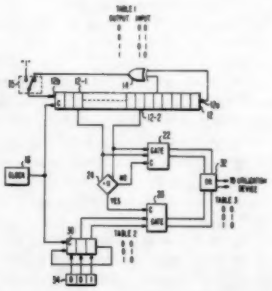
multiple time delays each less than Δt_o and multiple logic means for progressively selecting the first-in-time and second-in-time of signals in signal pairs based on t_1 and t_2 or on t_1 and t_2 plus selected time delays with the time delays being selectively added to the first-in-time signals to progressively reduce the maximum uncertainty between the signals and shift the signals towards t_{max}.

4,408,298

PSEUDO RANDOM NUMBER GENERATOR APPARATUS

Kim Ruhland, Shillington, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 26, 1981, Ser. No. 277,982
Int. Cl.³ H03K 3/84
U.S. Cl. 364—717 **5 Claims**



1. A random number generator for generating three numeric values in random order, comprising in combination:

first means for generating at a given rate a succession of two-bit numbers for generating at random said three values and for also generating a fourth undesired value;

second means generating at said given rate in succession solely said three values; and

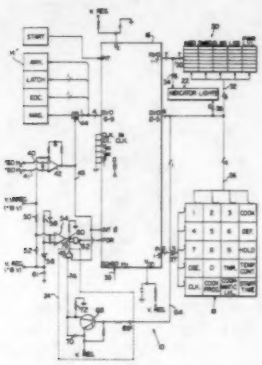
third means responsive to the presence of said fourth undesired value for disabling the output of said fourth value by said first means and for enabling the output of said second means of the value then being generated by said second means.

4,408,299

AUTOMATIC RESETTING OF CONTROL SYSTEM FOR LOSS OF FUNCTIONALITY

Glen C. Young, Fort Wayne, Ind., assignor to Essex Group Inc., Fort Wayne, Ind.

Filed Oct. 30, 1980, Ser. No. 202,105
Int. Cl.³ G06F 11/30; H05B 1/02
U.S. Cl. 364—900 9 Claims



1. In an appliance control system for controlling the operation of electrical control signal responsive means associated with an appliance, the control system including input means for entering functional electrical commands, electrical signal processing means connected to the control signal responsive means and receiving input commands from the input means, the signal processing means containing a programmed memory for storing instruction words which define operating sequences for the control signal responsive means, the signal processing means further including logic means for sequentially executing the instruction words to provide control signals to operate the control signal responsive means in response to commands from the input means, the signal processing means being programmed to provide at a location a signal having a voltage level transition normally occurring within a particular time interval relative to a certain reference, and the signal processing means also including means responsive to a reset command extended thereto for setting the execution of the programmed instruction words to a predetermined initial point in the program sequence from which a predetermined sequence of initializing operations is automatically initiated, the improvement comprising:

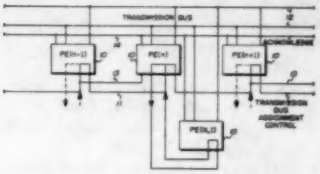
means automatically responsive to said normally occurring signal transition failing to occur at said location within said particular time interval relative to said reference for generating a reset command signal and extending said reset command signal to said means for setting the execution of the programmed instruction words to said initial point, said reset command generating means comprising a timing capacitance means and threshold means for determining said particular time interval, said capacitance means being charged at a predetermined rate and being connected to said threshold means for providing a said reset command signal when said threshold is exceeded, and means responsive to said normally-occurring signal transition for discharging said timing capacitance means, said normally-occurring signal transition recurring at shorter intervals than the interval for said timing capacitance means to charge to said threshold.

4,408,300

SINGLE TRANSMISSION BUS DATA NETWORK EMPLOYING AN EXPANDABLE DAISY-CHAINED BUS ASSIGNMENT CONTROL LINE

George T. Shima, Kamakura, Japan, assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 15, 1980, Ser. No. 187,532
Int. Cl.³ H04Q 9/00
U.S. Cl. 364—900 12 Claims



1. A network of stations for data transmissions therebetween, said network comprising:

a single transmission bus;

a plurality of stations coupled to said bus;

a bus assignment control line coupled to each of said stations in a serial manner;

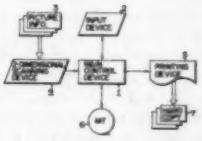
each of such stations including a priority switch means to receive a bus assignment control pulse on said control line and, if that station does not require access to the transmission bus, to retransmit that pulse to a higher priority station or to a lower priority station in accordance with the number of previous bus assignment control pulses that have been received; and each of such stations also including a priority counter means being disposed for counting the number of previous bus assignment control pulses that have been received.

4,408,301

PICTURE INFORMATION FILING SYSTEM

Kazuhiko Iida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 5, 1980, Ser. No. 203,573
Claims priority, application Japan, Nov. 6, 1979, 54-143714; Nov. 6, 1979, 54-143715; Nov. 6, 1979, 54-143717
Int. Cl.³ G06F 3/14
U.S. Cl. 364—900 3 Claims



1. A picture information filing system comprising:

a two-dimensional scanning device for scanning picture information in a two-dimensional manner and generating electrical signals related thereto;

a signal compressing circuit for compressing data contained in said electrical signals to form compressed data;

a page buffer for storing one page of picture information embodied in said compressed data;

a nonvolatile storage device, responsive to said page buffer, said storage device having a picture information recording area for storing said compressed data, a character code information recording area storing data in the form of alpha-numeric characters and an auxiliary area;

a record/reproduce circuit for recording/reproducing said information in said storage device;

a signal elongating circuit for reforming said electrical signals from said compressed data received from said record-/reproduce circuit;

a picture element memory for storing said electrical signals from at least one of said scanning device and said elongating circuit;

a display device for displaying picture information in response to said electrical signals from said picture element memory, said picture element memory acting as a display buffer for said display device;

a keyboard device having function keys for specifying areas of picture information displayed on said display device to be extracted and for specifying displacing positions of said extracted areas to obtain picture information, said keyboard device also having character keys for inputting character code information;

a random access memory for storing blank electric signals for indicating blank areas when applied to said display device;

a cursor controller, responsive to said keyboard device and connected to said display device for generating signals related to the location of said extracted areas and said displacing positions and for causing cursors to be displayed on said display device related thereto;

direct memory access means, connected to said random access memory and said picture element memory, for (1) transferring said blank electrical signals to said picture element memory for areas of said picture information outside of said extracted areas and (2) transferring electric signals for said extracted areas from their initial locations in said picture element memory to locations corresponding to said displacing positions to created shifted extracted data, said shifted extracted data being transferred for storage in said nonvolatile storage device auxiliary area through said compressing circuit and said page buffer;

a refresh memory for temporarily storing said character code information input by said keyboard device;

a character pattern generator responsive to said refresh memory for outputting to said display device a character pattern corresponding to said character code information;

logic gate means for selectively synthesizing picture element information from said picture element memory and said nonvolatile storage device, said shifted extracted picture information from said auxiliary area of said nonvolatile storage device and said character pattern information from said character pattern generator; and

a central processing unit, connected to said display device, said keyboard device, said storage device, said direct memory access means, said random access memory and said logic gate means for (1) controlling the display of said picture information from said picture element memory, (2) controlling said transferring of said blank electrical signals and said transferring of said electric signals, (3) controlling the storage of said shifted extracted data in said nonvolatile storage device and (4) controlling the synthesis by said logic gate means of picture element information from said picture element memory and said nonvolatile storage device, said shifted extracted picture information from said auxiliary area of said nonvolatile storage device and said character pattern information from said character pattern generator.

4,408,302

WORD PROCESSOR WITH DISPLAY DEVICE

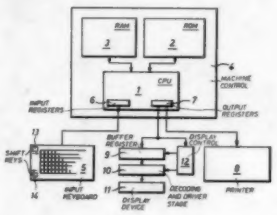
Rudolf Fessel, Jever; Karl-Friedrich von Knorre, Varel; Peter Tillich, and Gottfried Herbermann, both of Wilhelmshaven, all of Fed. Rep. of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Apr. 10, 1980, Ser. No. 139,115

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1979, 2915673

Int. Cl.³ G06F *3/14*

U.S. Cl. 364—900 **3 Claims**



1. In a word processing machine which operates to provide text in the form of successive lines of characters, and includes an input keyboard for the input of character representations and special instructions, a data memory connected for storing such representations, a display device connected to receive such representations from the memory and including a horizontally-extending plurality of character display locations the right-hand one of which is an entry location, and control means, connected to said keyboard, said memory and said display device, for controlling the display provided by the display device in a manner to cause the display device to display at least a portion of a line of characters, with each character appearing, in the order of its input to the keyboard, at the entry location of the display and then shifting to the left in the display upon delivery of each subsequent character to the display, the improvement wherein said display device further includes a plurality of further character display location to the right of said entry location; and wherein said control means

(a) are responsive to a shift instruction fed in via said keyboard for causing at least a portion of a line of previously inputted characters to be shifted to the right and displayed at adjacent ones of said character display locations, including said further locations,

(b) are further operable for controlling transfer, from said data memory to said display device, of representations of characters of text previously fed into said machine in such a manner as to cause the associated characters to be displayed at said character display locations, including said further locations, and

(c) are arranged for utilizing said further character display locations, during the performance of character input operations via said keyboard, for displaying non-text information useful to the operator and for suppressing such information when the text is to be displayed in said further locations.

4,408,303

DIRECTLY-COUPLED AND CAPACITIVELY COUPLED NONVOLATILE STATIC RAM CELL

Daniel C. Guterman, Plano, and James D. Kupec, Dallas, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 28, 1981, Ser. No. 335,160

Int. Cl.³ G11C *11/24, 11/40*

U.S. Cl. 365—205 **15 Claims**

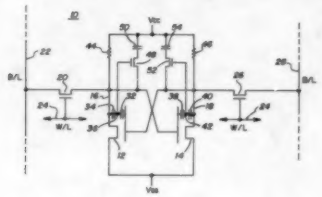
1. A nonvolatile static random access memory cell comprising:

cross-coupled transistor means having first and second nodes

which are maintained at complementary logic states for volatile data storage;

at least one tunnel capacitor means, each said tunnel capacitor means connected to a corresponding floating node and operatively coupled to the gate and drain terminals of one of said cross-coupled transistor means;

at least one switch transistor means, each said switch transistor means operatively coupled to one of said first and second nodes and to the floating node of one of said at least one tunnel capacitor means; and



means for coupling each of said switch transistor means to a first power terminal for said memory cell, said at least one tunnel capacitor means charged for nonvolatile data storage wherein volatile data is stored in said cross-coupled transistor means, said means for coupling operatively coactive with said at least one switch transistor means for recalling nonvolatile stored data in its true state to said cross-coupled transistor means.

4,408,304

SEMICONDUCTOR MEMORY

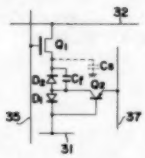
Jun-ichi Nishizawa; Ohmi Tadahiro, and Takashige Tamamushi, all of Sendai, Japan, assignors to Semiconductor Research Foundation, Japan

Filed May 4, 1981, Ser. No. 260,297

Claims priority, application Japan, May 17, 1980, 55/65818

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—174 **6 Claims**



1. A semiconductor memory which is provided with a memory cell comprising;

a hook structure composed of a first region of a first conductivity type, a second region of said first conductivity type, a third region of a second conductivity type reverse from the first conductivity type and a fourth region of said first conductivity type, the first to fourth regions being sequentially formed on a semiconductor substrate and the third and fourth regions being made floating;

a write and/or refresh transistor using the third region of the hook structure as one of its main electrode regions; and

a readout transistor using the fourth region of the hook structure as one of its main electrode regions.

4,408,305

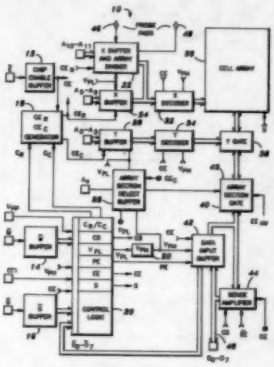
MEMORY WITH PERMANENT ARRAY DIVISION CAPABILITY

Clinton C. K. Kuo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1981, Ser. No. 305,830

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—189 **5 Claims**



1. In a memory comprising:

an array of memory elements, said array divided into first and second halves; and

decoder means for selecting a memory element from the first half of said array when a first address signal is in a first logic state and for selecting a memory element from the second half of said array when the first address signal is in a second logic state;

array divider means for providing the first address signal in a selected one of said first and second logic states in response to having received an array divider signal, wherein the selection of the first or second logic state in response to the array divider signal is permanent, whereby the decoder means permanently select a memory element from only the half of said array which corresponds to the selected logic state of the first address signal.

4,408,306

COLUMN AND ROW ERASABLE EEPROM

Clinton C. K. Kuo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1981, Ser. No. 306,120

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—218 **4 Claims**

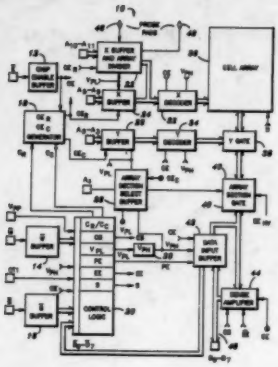
1. An electrically erasable programmable read only memory (EEPROM) comprising:

an array of electrically erasable memory elements arranged with one of said memory elements at the intersection of each of a plurality of rows and columns of said array;

logic means for generating, in response to a row erase mode signal, a row control signal at a first logic state and a column control signal at a second logic state;

column select means for coupling, when the column control signal is at the second logic state, an erase signal to all of the columns of said array; and

row decoder means for enabling, when the row control signal is at the first logic state, said erase signal to electrically erase the memory elements comprising the row of said array selected in response to a row address signal.

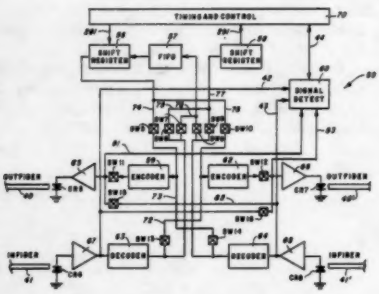


4,408,307

OPTICAL TRANSMISSION OF DIGITAL SEISMIC DATA

Ralph A. Harris, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 973,485, Dec. 26, 1978, abandoned.
This application Nov. 24, 1980, Ser. No. 209,638
Int. Cl.[3] G01V 1/22
U.S. Cl. 367—79 17 Claims



1. A seismic data acquisition system having a plurality of data acquisition units positioned over a seismic prospect area which units have provision for sensing motion in an elastic body and a controller means for providing command signals to, and for receiving data and status signals from, the data acquisition units, comprising:

(a) telemetry interface means operatively connected to the controller means;

(b) data acquisition means for the data acquisition units for receiving and formatting signals representative of sensed motion;

(c) a pair of optical fibers comprising an in-fiber and an out-fiber for light communication between the telemetry interface means and the data acquisition units; and

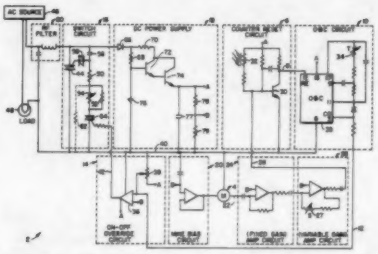
(d) telemetry communications means in each of the data acquisition units, for receiving the pair of optical fibers, operatively connected to the respective data acquisition means and having signal detect means for automatic detection of the optical fiber on which the command signals from the controller means are present, providing automatic orientation of the data acquisition units.

4,408,308

SOUND ACTUATED LIGHT SWITCH

Blaine M. Smith, and James A. Taylor, both of Beaverton, Oreg., assignors to Ehrenreich Electronics, Inc., Great Neck, N.Y.

Filed Jun. 16, 1981, Ser. No. 273,570
Int. Cl.[3] H01H 36/00, 35/24; G08B 13/22; H04Q 1/18
U.S. Cl. 367—197 12 Claims



1. A switch connected in series with and between an alternating current power source and a load for actuation of the load upon receipt of an audible external stimulus comprising:

a direct current power supply connected in series with and between said alternating current power source and said load and having at least one direct current output;

means for sensing said audible external stimulus and producing a first electrical signal representative of the stimulus at a first output thereof;

a reset circuit means having a reset circuit input electrically coupled to the first output for producing a reset signal at a reset output when the electrical signal at the reset circuit input exceeds a chosen level;

timing means coupled to the reset output for providing on and off control signals at a control output, said on control signal provided during receipt of the reset signal and for a first period of time after said reset signal ceases, said off control signal provided thereafter;

said timing means further comprising an electronic oscillator means for producing an oscillating signal and an electronic counter coupled to the oscillator means and having a reset input coupled to the reset output and adapted to begin a count cycle by counting oscillations of the oscillating signal starting at a first count upon receipt of said reset signal, said counter means including means for producing an on control signal at a counter output upon receipt of said reset signal and an off control signal after the electronic counter reaches a certain count corresponding to a predetermined time interval during which said reset signal is not received; and

connecting switch means, having a switch input connected to said control output and being responsive to said control signal, for electrically connecting the alternating current power source to the load when the on control signal is present.

4,408,309

TIME DELAYED RECORDING SYSTEM

Roy A. Kiesling, 97 Douglass Way, Atherton, and Roy A. Kiesling, III, 50 Hayfields Rd., Portola Valley, both of Calif. 94025

Filed Jul. 20, 1981, Ser. No. 284,529
Int. Cl.[3] G11B 5/86
U.S. Cl. 369—7 6 Claims

1. For a receiver system having a receiver portion, an amplifier portion, a switched power output terminal, an auxiliary output terminal and a monitor input terminal, and a recording

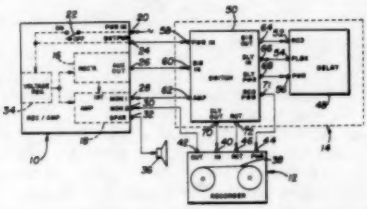
system having storage medium, a signal input terminal, a power input terminal and a remote control input terminal, said receiver portion developing a continuous signal at said auxiliary output terminal, said monitor input terminal being operatively connected to said amplifier portion, said signal input terminal being operatively connected to said storage medium, said remote control input terminal being operative to activate said storage medium when said power signal is applied to each of said power input terminal and said remote control input terminal, a time delay apparatus for ex post facto selecting a portion of said continuous signal and storing said portion in said storage medium, said time delay apparatus comprising:

delay means for delaying said continuous signal for a selected time when said delay means is made responsive to said continuous signal and operative to develop a delayed signal; and

switch means defining a first, second, third and fourth switching state;

in said first state, said switch means being for coupling said auxiliary output terminal to said monitor input terminal for application of said continuous signal to said amplifier portion;

in said second state said switch means being for coupling said auxiliary output terminal to each of said monitor input terminal and said delay means for application of said continuous signal to each of said amplifier portion and said delay means, and further for coupling said switched power output terminal to said delay means for application



of said power signal to said delay means to make said delay means responsive to said continuous signal;

in said third state said switch means being for coupling said auxiliary output terminal to said delay means for application of said continuous signal to said delay means, further for coupling said switched power output signal to each of said delay means and said power input terminal for making said delay means responsive to said continuous signal and preparing said recording system for storage of said portion, and further for coupling said delay means to each of said monitor input terminal and said signal input terminal for application of said delay signal to each of said amplifier portion and said storage medium; and

in said fourth state said switch means being for coupling said auxiliary output terminal to said delay means for application of said continuous signal to said delay means, for coupling said switch power output terminal to each of said delay means, said power input terminal and said remote control input terminal for application of said power signal to each of said delay means and said recording system for making said delay means responsive to said continuous signal, and for coupling said delay means to each of said monitor input terminal and said signal input terminal for application of said delayed signal to each of said amplifier portion and said storage medium, said power signal being applied to each of power input terminal and said remote control input terminal for commencing storage of said portion of said continuous signal.

4,408,310

SIMPLIFIED SOUND REPRODUCING DEVICE DRIVEN BY A SPRING MOTOR

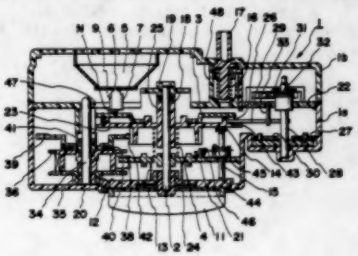
Katsumi Watanabe, Kawasaki, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,655

Claims priority, application Japan, Mar. 25, 1981, 56-43676

Int. Cl.[3] **G11B** *17/00, 31/00, 3/00*

U.S. Cl. 369—41 **4 Claims**



1. A simplified sound reproduction device driven by a spring motor comprising:

a casing;

an upright center shaft disposed within the casing;

a record disc rotatably and axially movably disposed for advanced and retracted movement about the center shaft, the record disc having a recessed central portion and a recorded face with starting and end points of sound reproduction, the record disc being received and supported by the center shaft;

first spring means disposed about the center shaft for biasing the record disc to its advanced position along the center shaft;

a speaker cone mounted within the casing;

a vibration plate mounted at the bottom of the speaker;

a tone arm swingably mounted on the casing;

second spring means for biasing the tone arm away from the record disc and towards the starting point of sound reproduction;

a pickup carried by the tone arm;

a sound reproducing stylus carried by the pickup;

means for stopping rotation of the record disc when the stylus reaches the end point of sound reproduction;

a winding knob reciprocally movable along the center shaft and rotatable between winding and retracted positions;

a winding wheel reciprocally movable and rotatably disposed about the center shaft and adapted to be coupled and rotatable with the winding knob upon depression of the winding knob and rotation of the winding knob only in the direction of winding the spring motor to wind the spring motor;

third spring means for biasing the winding knob and the winding wheel to the retracted position;

at least one starting post disposed parallel to the center shaft and being axially movably disposed within the casing;

fourth spring means for biasing the starting post away from the record disc;

the starting post, when depressed, engaging and moving the record disc to its retracted position;

means for temporarily stopping rotation of the record disc including:

a locking member affixed to the face of the record disc opposite from the recorded face;

a reverse slippage restraining post mounted in the casing and disposed betwen the winding wheel and the record disc, the reverse slippage restraining post being axially movable and adapted to be moved into engagement with the locking member when engaged and axially advanced by the

winding wheel for temporarily stop plug rotation of the record disc, the reverse slippage restraining post disengaging from the locking member by movement of the record disc towards its retracted position.

4,408,311

OPTICAL TRACKING APPARATUS

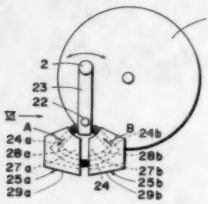
Junichi Suzuki, Kawasaki, and Kenji Shintani, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,514

Claims priority, application Japan, May 16, 1980, 55-67381[U]

Int. Cl.³ G11B *7/00, 21/10*

U.S. Cl. 369—43 **8 Claims**



1. An optical tracking apparatus for tracing at least one track on a recording disk to reproduce an information signal recorded in said at least one track, comprising:

optical pickup means having light-emitting means for projecting a light beam onto said recording disk to modulate said light beam with said information signal and photoelectric conversion means for producing said information signal in response to said modulated light beam;

arm means pivotally mounted to an arm shaft so as to be adapted to rotate in a first plane and having a first and a second end, said pickup means being mounted to said first end so as to be adapted to move substantially along the radial direction of said recording disk;

arm drive coil means attached to said second end of said arm means and having a current path loop in parallel with the first rotational plane of said arm means;

means for producing an arm drive signal;

means for producing a tracking error correction signal in response to said modulated light beam; and

stationary magnetic field forming means having at least one pair of air gaps in which magnetic fields in opposite directions to each other are formed, said arm drive coil means being arranged to move in said at least one pair of air gaps and being supplied with said arm drive signal and said tracking error correction signal for causing said pickup means to trace at least one track.

4,408,312

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS WITH A TRACKING CONTROL DEFEATING CIRCUIT FOR RAPID TRACK ACCESS

Hiroyuki Sugiyama, Isehara; Isami Kaneda; Ryozo Abe, both of Yokohama; Susumu Sakakibara, Sagamihara, and Yasushi Sano, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 21, 1981, Ser. No. 303,982

Claims priority, application Japan, Sep. 22, 1980, 55-131904

Int. Cl.³ G11B *21/08, 21/10*; H04N *5/76*

U.S. Cl. 369—43 **5 Claims**

1. A reproducing apparatus for reproducing a rotary recording medium in which one and the other of first and second reference signals are alternately recorded on every track turn, the reference signals being recorded between each track turn of a main information signal track, said rotary recording medium having a third reference signal recorded thereon at positions corresponding to the positions where the recording of said first and second reference signals are alternately changed over every said track turn, said reproducing apparatus comprising:

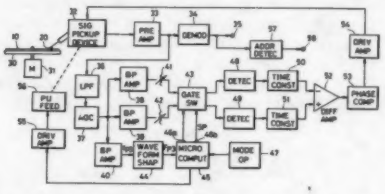
reproducing transducer means having a reproducing element for reproducing said main information signal and the first and second reference signals at both sides of said main information signal track, said reproducing transducer having means for controlling the tracking of said reproducing element;

separation circuit means for respectively separating said first and second reference signals from a signal reproduced by said reproducing transducer means;

wave detection circuit means for respectively wave-detecting said separated reference signals;

time constant circuit means for eliminating an unwanted component in an output signal of said wave detection circuit means and for holding a required signal;

tracking control signal applying circuit means for obtaining a tracking control signal from an output signal of said time constant circuit means and for applying the tracking control signal to the tracking control means of said reproducing transducer;



interrupting circuit means at a stage before said time constant circuit means, for interrupting the transmission of said reproduced reference signals during a mode in which a tracking control operation is not performed;

circuit means for separating the third reference signal from the signal reproduced by said reproducing transducer means;

switching signal forming circuit means for forming a switching signal in response to said separated third reference signal; and

changeover circuit means responsive to the switching signal supplied from said switching signal forming circuit means, for alternately changing over and supplying said separated first and second reference signals to said detection circuit means,

said switching signal forming circuit means putting said changeover circuit means in a signal transmission interrupting state during the mode in which the tracking control operation is not performed.

4,408,313

OBJECTIVE LENS DRIVING DEVICE FOR TRACKING AND FOCUS CORRECTIONS

Toru Musha, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,522

Claims priority, application Japan, Jul. 9, 1980, 55-93568

Int. Cl.³ G11B *7/12*

U.S. Cl. 369—45 **8 Claims**

1. In an objective lens driving device for correcting a relative positional error, i.e., a tracking error, between an information track recorded spirally or concentrically on a record medium and a reading-out light spot projected onto the record medium by means of the objective lens by moving the objective lens in a direction perpendicular to the optical axis of said

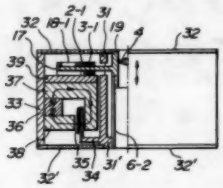
objective lens and information track, the improvement which comprises:

at least one set of objective lens driving means, each set including:

an elongated movable member comprising a magnetic body movable together with the objective lens or a holding frame therefor;

a stationary yoke extending in a direction which is substantially parallel with the moving direction of said movable member and spaced apart from and opposed to said movable member at both end portions to provide interposing gaps;

a magnetic field generation means for producing a closed loop magnetic field passing through said movable member and stationary yoke via said gaps;



a coil wound around at least one end portion of said stationary yoke such that at least one portion of said coil is exposed to the magnetic field produced by said magnetic field generation means in at least one said gap; and

objective lens supporting means for movably supporting said objective lens in said direction perpendicular to the optical axis of said objective lens and information track;

said coil being supplied with an electric current corresponding to a tracking error signal representing said relative positional error so as to displace said movable member comprising the magnetic body and hence said objective lens in said direction perpendicular to the optical axis of said objective lens and information track to correct the tracking error.

4,408,314

RECORD/PLAYBACK TRACK TRACKING SERVO

Tsuneshi Yokota, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 23, 1981, Ser. No. 237,260

Claims priority, application Japan, Feb. 29, 1980, 55-25082; Feb. 29, 1980, 55-25083

Int. Cl.³ G11B *7/00, 19/02, 21/10*

U.S. Cl. 369—46 **14 Claims**

1. A tracking servo control device for maintaining track registration during the recording onto or playback from a track of a rotating disc-shaped recording medium having a recording layer, comprising:

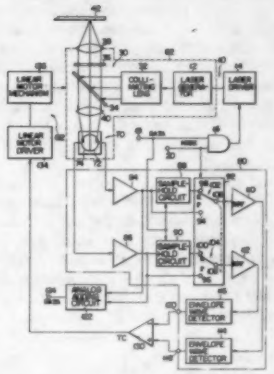
(a) laser source means for alternately generating first and second intensity laser beams during recording and for continuously generating a laser beam of said first intensity during playback, said second intensity being greater than said first intensity and being sufficient to change said recording layer so as to record data on said recording layer in an optically readable manner;

(b) an optical head movable in a radial direction of said rotating recording medium;

(c) laser beam transmitting means, within said optical head, for focusing said laser beams onto said recording layer and conducting light reflected from said recording layer in a predetermined direction;

(d) photoelectric transducing means, within said optical head having two photo detecting elements, for generating, in response to light reflected from said recording layer and transmitted via said laser beam transmitting means, first and second electrical signals corresponding to a first portion of light so transmitted and to a second remaining portion of the light, respectively, each electrical signal containing first and second components corresponding respectively to said first and second intensity laser beams reflected from the record layer;

(e) wave-shaping means, electrically coupled to said photoelectric transducing means, for removing said second component from each of said first and second signals during recording to produce respectively corresponding third and fourth electrical signals;



(f) signal generating means, electrically coupled to said wave-shaping means, for detecting a level difference between said third and fourth electrical signals and generating a fifth electrical signal corresponding to the level difference therebetween; and

(g) drive means, electrically coupled to said signal generating means and mechanically coupled to said optical head, for driving said optical head in response to said fifth electrical signal to thereby adjust its position relative to said track of the recording medium so that said laser beams correctly illuminate said track.

4,408,315

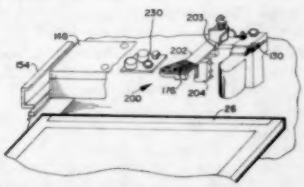
VIDEO DISC PLAYER HAVING STYLUS CLEANING APPARATUS

Gopi N. Mehrotra, Carmel, and Gerald Van Arsdall, Greenwood, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,454

Int. Cl.³ G11B *3/58*

U.S. Cl. 369—71 **4 Claims**



4. In a record player including a pickup stylus subject to engagement with a turntable-supported record for recovering prerecorded information from said record; said stylus being mounted at one end of a stylus arm; the other end of said stylus arm being supported in a carriage which is subject to translatory motion along a path between a starting position and an ending position; said player further including means for selectively lowering said stylus when activated; said stylus lowering

means including a magnetic element secured to a stylus arm rest and an electrical winding which, when energized, acts upon said magnetic element to lower said stylus arm rest and thereby said stylus arm; stylus cleaning apparatus comprising:

(A) a stylus cleaning element;

(B) means for causing relative motion between said cleaning element and said stylus;

(C) means for sensing when said stylus is occupying a position over said cleaning element; said sensing means comprising a mechanically-actuated switch which is operated when said cleaning element is underneath said stylus;

(D) control means coupled to said sensing means for activating said stylus lowering means, whereby said stylus is made to contact said stylus cleaning element; said electrical winding, said control means and said switch being disposed in series between a voltage source and ground; said control means, when turned on, allowing passage of electrical current through said winding to lower said stylus onto said cleaning element upon actuation of said switch; and

(E) timing means responsive to said sensing means for automatically turning off said control means upon elapse of a preset time interval to block any current from flowing through said winding, whereby said stylus is lifted upward away from said cleaning element; wherein said timing means comprises a series resistor/capacitor combination connected between said voltage source and said ground to automatically turn off said control means.

4,408,316

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS HAVING A JACKET OPENING ENLARGING DEVICE

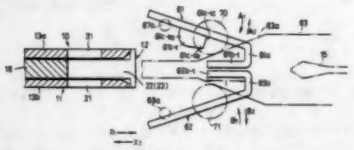
Takashi Saito, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 18, 1981, Ser. No. 293,835

Claims priority, application Japan, Aug. 18, 1980, 55-116721[U]

Int. Cl.³ G11B *1/00*

U.S. Cl. 369—77.2 **7 Claims**



1. An apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket having a space for accommodating the rotary recording medium therein and an opening through which said medium can enter and leave the jacket and a lid member inserted through said opening of the jacket for covering and closing the opening, said reproducing apparatus comprising:

a front side having an elongated inserting opening therein through which the case is inserted;

holding means disposed at a rear part of the reproducing apparatus, for holding the rotary recording medium within the reproducing apparatus responsive to an insertion of the case into the reproducing apparatus and then a withdrawal of the jacket from the reproducing apparatus;

turntable means positioned between said inserting opening and a rear part of the reproducing opening for rotating the recording medium thus left within the reproducing apparatus; and

jacket opening enlarging means for coupling with the jacket and being movable over the turntable means between the inserting opening and said rear part of the reproducing apparatus, said enlarging means coordinating with the insertion and extraction of said case having the jacket,

said jacket opening enlarging means comprising

upper and lower elongated enlarging members aligned horizontally with said inserting opening when said jacket opening enlarging means is prepared for receiving the inserted case, said upper and lower enlarging members being pivotally coupled to each other with their front edges being mutually open toward said inserting opening and their rear edges being mutually closed;

finger means projecting toward said inserting opening on the respective front edges of said upper and lower enlarging members, said fingers entering into cutouts in the lid member and mutually separating from each other to enlarge the opening of the jacket as the case is inserted through the inserting opening and into the reproducing apparatus; and

means for opening said respective rear edges of said upper and lower enlarging members to mutually separate from each other as said jacket opening enlarging means moves towards said rear part of said reproducing apparatus during the insertion of the case.

4,408,317

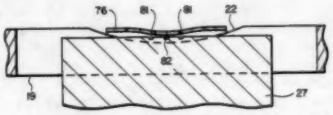
MAGNETIC TAPE APPARATUS

Paul A. Gilovich, Saratoga, and James S. Toreson, Mountain View, both of Calif., assignors to Microcomputer Systems, Inc., Sunnyvale, Calif.

Division of Ser. No. 151,394, May 19, 1980. This application Apr. 16, 1982, Ser. No. 369,204

Int. Cl.³ G11B *15/43*

U.S. Cl. 360—74.3 **3 Claims**



1. A magnetic tape apparatus comprising a drum, means for supporting and rotating said drum, at least one transducer mounted to rotate with said drum and extending past the surface of said drum through a slot formed in said drum, means including a take-up means and supply means for presenting a selected length of tape to said drum and maintaining said length of tape in cooperative relationship with said drum so that the transducer scans along longitudinal tracks as it rotates past said tape, means for moving said transducer longitudinally along said slot so that it moves along a plurality of parallel laterally spaced tracks on said tape, means in said take-up means for providing a predetermined tension to said tape whereby to maintain a constant air cushion between said tape and said drum, said means including means for moving the take-up means a predetermined additional amount after said selected length of tape is presented to said drum from said supply means.

4,408,318

MAGNETIC SHEET MOUNTING DEVICE

Yutaka Sugiura, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 190,864, Jan. 17, 1980, abandoned. This application Apr. 16, 1982, Ser. No. 368,999

Claims priority, application Japan, May 31, 1978, 53-74521

Int. Cl.³ G11B *3/62*

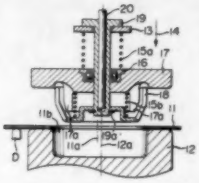
U.S. Cl. 369—261 **8 Claims**

1. A recording sheet mounting device, comprising:

a shaft member having a recess adjacent to the center thereof, for supporting a recording sheet having an aperture;

a first projection member having a first projection engageable with said recess and adapted to engage with the aperture of the recording sheet, said first projection having at least one cut-away portion to facilitate enlargement of the diameter thereof;

a second projection member having a second projection for acting on an inside portion of said first projection member to thereby enlarge same when the center of the aperture of the



recording sheet and the center of said shaft member do not substantially coincide, said second projection being deformable to achieve a decrease in the diameter thereof in response to a force applied thereto by said first projection member when the center of the aperture of the recording sheet and the center of said shaft member substantially coincide; and

an urging member, integral with said second projection member, for urging the recording sheet to said shaft member when the diameter of said second projection decreases.

4,408,319

OPTICAL INFORMATION RECORDING MOTHER DISC AND METHOD OF PRODUCING THE SAME

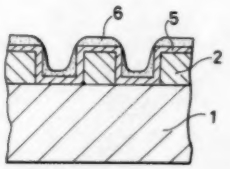
Taiji Tsunoda; Takashi Nishio, and Eiki Tanikawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 56,667, Jul. 11, 1979, abandoned. This application Jun. 15, 1981, Ser. No. 273,999

Claims priority, application Japan, Jul. 15, 1978, 53-86356; Jul. 15, 1978, 53-86357; Jul. 15, 1978, 53-86358

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—275 **6 Claims**



6. A method of producing an optical information recording mother disc containing a plurality of pits, the length and the repetitive rate of said pits representing information recorded on said disc, comprising the steps of forming pits in a first layer formed on one major surface of a substrate disc in response to information, each of said pits extending throughout the thickness of said first layer and having vertical walls, providing a liquid film on said first layer and then hardening said liquid film so that a second layer having continuously increased thickness towards the bottom of each of said pits is formed on said first layer to thereby facilitate the forming of replicas of said optical information recording mother disc by transferring said pits to said replicas.

4,408,320

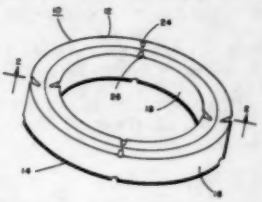
SPACER FOR USE IN TESTING INFORMATION RECORDED DISCS

Alexander W. Buzgo, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,515

Int. Cl.³ G11B *23/00*

U.S. Cl. 369—290 **12 Claims**



1. A spacer ring for use in testing information recorded discs comprising an unbroken annular substantially flat body having concave top and bottom surfaces and at each of the surfaces at least one passage extending radially inwardly from the outer periphery of the body and at least one passage extending radially outwardly from the inner periphery of the body.

4,408,321

DISC-SHAPED RECORDING MEDIUM REPRODUCING APPARATUS

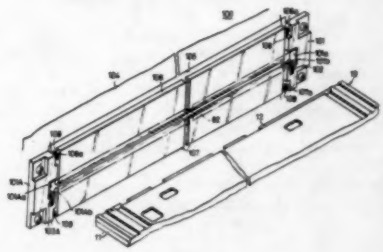
Takashi Yamamura, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 24, 1981, Ser. No. 257,183

Claims priority, application Japan, Apr. 28, 1980, 55/58938[U]

Int. Cl.³ G11B *1/00*

U.S. Cl. 369—77.2 **7 Claims**



1. A reproducing apparatus for reproducing a disc-shaped recording medium which is accommodated within a case, said case comprising a jacket which has a space for accommodating said disc-shaped recording medium and an opening for enabling said disc-shaped recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said reproducing apparatus comprising:

a panel defining an inserting opening through which said case is inserted into said reproducing apparatus, said inserting opening having edges defining a shape generally corresponding to approximately the shape of said case;

a turntable for rotating said disc-shaped recording medium;

clamping means for clamping at least one of said disc-shaped recording medium or said lid member at an inside part of the reproducing apparatus which is opposite the panel defining said inserting opening, with said turntable located between said inside part and said panel; and

guiding members made of a material which is different from

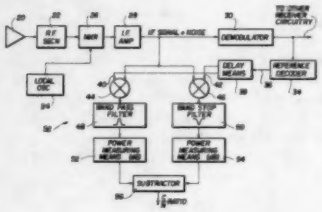
the material of said edges of said inserting opening, said guiding members being positioned adjacent an edge of said inserting opening and arranged to protrude within said inserting opening to prevent a direct contact between said case and said edge of said inserting opening.

4,408,322

METHOD AND APPARATUS FOR MEASURING SIGNAL TO NOISE RATIO IN A TDMA COMMUNICATIONS SYSTEM

Henry D. Chadwick, Reston, Va., and David W. Matthews, Mt. Airy, Md., assignors to Satellite Business Systems, McLean, Va.

Filed Nov. 7, 1980, Ser. No. 204,981
Int. Cl.³ H04J *1/16, 3/06*
U.S. Cl. 370—17 **14 Claims**



8. An apparatus for measuring signal to noise ratio in a time division multiple access communications system in which a plurality of transmission sources communicate with a receiver, without interrupting normal communications, said communications system being of the type in which time is divided into frames which are comprised of a plurality of sequential bursts from different transmission sources, and wherein the preamble of each burst includes an unmodulated carrier signal which is used as a reference signal for the demodulator at the receiver, comprising,

means for measuring the amplitude of said unmodulated carrier signal of a said burst or a quantity indicative of said carrier amplitude, at said receiver,

means for measuring the amplitude of the noise which accompanies said unmodulated carrier signal within a certain frequency range of the carrier frequency, at said receiver, or a quantity indicative of said noise amplitude; and

means for providing an indication of the ratio of said signal amplitude to said noise amplitude.

4,408,323

PROCESSOR FACILITIES FOR INTEGRATED PACKET AND VOICE SWITCHING

Warren A. Montgomery, De Kalb, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 29, 1981, Ser. No. 278,861
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—60 **38 Claims**

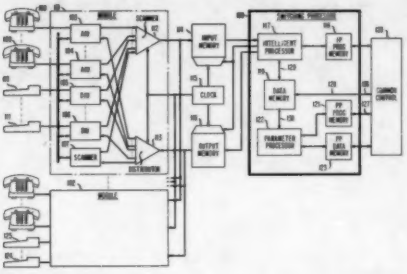
1. A telecommunication switching system for interconnecting digitally encoded voice signals between a set of randomly selectable input ports and a set of randomly selectable output ports and for assembling digital data signals from another set of said randomly selectable input ports into packets and transmitting said packets to another set of said randomly selectable output ports, said system comprising:

a first storage means for storing said digitally encoded voice signals and said digital data signals from said input ports into predetermined storage locations;

switching processor means responsive to a receipt of a first set of program instruction routines for processing said stored digitally encoded voice signals;

a second storage means connectable to said output ports for storing said processed voice signals in predetermined storage locations thereof;

said switching processor means being responsive to a receipt of a second set of program instruction routines for processing said stored digital data signals to assemble and store said packets in said switching processor means; and



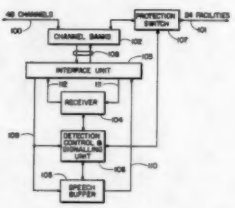
said switching processor means being responsive to a receipt of a third set of program instruction routines for processing each of said packets for transmission of each of said processed packets to said second storage means; whereby said stored packets are transmitted to said other set of said output ports.

4,408,324

NOISE SIGNAL LEVEL CONTROL IN A TASI SYSTEM

David H. A. Black, Box 28, R.R. 1, Chelsea, Quebec, Canada (J0X 1N0), and Georges H. Pelletier, 225 des Voyageurs, Aylmer, Quebec, Canada (J9J 1P8)

Filed Dec. 22, 1980, Ser. No. 218,751
Claims priority, application Canada, Oct. 3, 1980, 361496
Int. Cl.³ H04J *6/02;* **H04M** *9/10*
U.S. Cl. 370—81 **7 Claims**



1. A method of mitigating noise signal contrast in a TASI system in which speech signals from a plurality of channels are interpolated and transmitted via a lesser plurality of transmission facilities, said method comprising the steps of:

monitoring the level of noise received at a receiver of the system via each facility while the facility is idle;

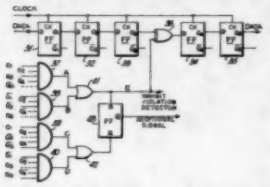
producing a noise signal with a level which is controlled in dependence upon the average monitored level of noise received via said facilities; and

supplying the controlled level noise signal to off-hook channels for which speech signals are not being received via the facilities.

4,408,325
TRANSMITTING ADDITIONAL SIGNALS USING VIOLATIONS OF A REDUNDANT CODE USED FOR TRANSMITTING DIGITAL SIGNALS

Wayne D. Grover, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 28, 1980, Ser. No. 211,697
Int. Cl.³ H04J 3/06
U.S. Cl. 370—119 **18 Claims**



1. A method of transmitting an additional signal via a transmission link via which a digital signal is transmitted from a transmitter to a receiver using a redundant transmission code, comprising:

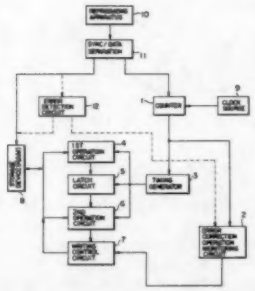
at the transmitter, in dependence upon said additional signal, selectively modifying a predetermined code combination, which occurs randomly in the encoded digital signal, to produce a predetermined code violation, and transmitting the encoded selectively modified digital signal; and

at the receiver, detecting and correcting each such predetermined code violation to reproduce said additional signal and said digital signal.

4,408,326
CIRCUIT FOR CORRECTING ERROR IN DIGITAL INFORMATION SIGNAL

Takashi Takeuchi, Fujisawa, and Harukuni Kobari, Yokohama, both of Japan, assignors to Hitachi, Ltd. and Victor Company of Japan, Ltd., both of Tokyo, Japan

Filed Sep. 24, 1981, Ser. No. 305,375
Claims priority, application Japan, Sep. 26, 1980, 55-132874
Int. Cl.³ G06F 11/10; H04N 5/76
U.S. Cl. 371—38 **3 Claims**



1. A circuit for correcting errors in an information signal having been subjected to a time-base variation as well as the errors due to passage of said information signal through a system, said information signal including a plurality of digital signal trains each having digital information data and error correction data with recurrent sync pulses interposed between adjacent two signal trains, the correcting circuit comprising:

a source of clock pulses;

means for generating a correction operation start signal in response to each of said sync pulses;

a counter arranged to count the clock pulses from said source during a time period between successive two correction operation start signals from said start signal generating means;

storage means including a first storage section serving to store said information signal and a second storage section;

a correction operation circuit arranged to be supplied with said information signal from said first storage section and having means for performing a plurality of operation steps for correcting the errors in said information signal with said error correction data, the results of said operation steps being stored in said second storage section;

means responsive to the output of said counter for generating an operation timing signal to be supplied to said correction operation circuit so that the performance of said plurality of operation steps are timed with said operation timing signal;

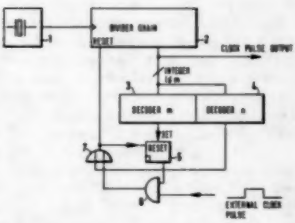
means responsive to the output of said counter for monitoring the degree of execution of operation steps in said correction operation circuit; and

means responsive to the output of said monitoring means for controlling writing of said operation results in said second storage section.

4,408,327
METHOD AND CIRCUIT FOR SYNCHRONIZATION

Helmut Wahl, Weissach, and Hagen Hofmeister, Korb, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 22, 1980, Ser. No. 188,991
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938228
Int. Cl.³ G06F 1/04, 9/00; H03K 5/13; G05B 19/02
U.S. Cl. 371—47 **7 Claims**



6. Method for synchronizing switching mechanisms or program sequences in data transmission devices with an external frame clock pulse subject to fluctuations within a given tolerance range, comprising gradually matching the leading edge of a generated internal frame clock pulse for the switching mechanism or program sequence with the leading edge of the external frame clock pulse arriving at changing points in time by:

(a) generating the internal frame clock pulse in synchronism with the leading edge of the external frame clock pulse if the leading edge of the external clock pulse appears during a fixed time period corresponding to said tolerance range;

(b) generating the internal frame clock pulse in synchronism with the leading edge of said fixed time period if the leading edge of the external frame clock pulse has appeared prior to said fixed time period; and

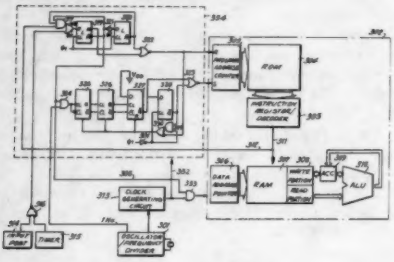
(c) generating the internal frame clock pulse in synchronism with the trailing edge of said fixed time period if the leading edge of the external frame clock pulse appears after said fixed time period.

4,408,328

MICROPROGRAM CONTROL CIRCUIT

Yoichi Wakai, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 11, 1981, Ser. No. 262,358
Claims priority, application Japan, May 12, 1980, 55-62530; May 12, 1980, 55-62532
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—62 **12 Claims**



1. In a processor including a main processor comprising a memory circuit having a plurality of addresses for storing instructions therein, an address counter circuit for selecting the addresses in sequence to be read from said memory circuit, thereby providing instructions in sequence to said main processor to perform a program, said program including a program terminating instruction, and a source of clock signals, said clock signals being input at least to said main processor and being necessary to continue operation of said main processor circuits in performance of said instructions, the improvement therein comprising:

means for triggering performance of said program by setting said address counter circuit to an initial address of said program;

means for controlling the flow from said clock signal source to said main processor circuit of said clock signals, the occurrence of said program terminating instruction in said instruction sequence causing said means for controlling to inhibit flow of said clock signals whereby operations of said main processor on said instructions cease, said means for triggering causing said means for controlling said clock signals to initiate flow of said clock signals;

means for measuring the time of main processor operation from the start of performance of said program instructions, said means for measuring being adapted to cause said address counter circuit to select a designated address when said terminating instruction fails to occur in said sequence of instructions within a predetermined time period.

4,408,329

LASER DEVICE WITH INTRARESONATOR HARMONIC GENERATOR

Gerald D. Ferguson, Yardley, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 4, 1978, Ser. No. 965,755
Int. Cl.³ H01S *3/10*
U.S. Cl. 372—21 **14 Claims**

1. A laser system, comprising, in combination:

a laser means for radiating light of a first wavelength in opposite directions along a first path when energized;

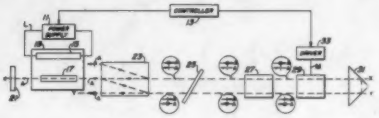
first reflection means positioned on said first path for reflecting the light from one direction into the laser means;

beamsplitter means positioned within the first path for polarizing the light from the other direction into a first component of radiation along the first path and into a second component along a second path parallel to said first path;

second reflection means positioned within said first and second paths for reflecting light in the first path into the second path and light in the second path into said first path;

Q-switch means positioned within said first and second paths for selectively rotating the polarized components one fourth of said first wavelength when energized;

frequency multiplying means positioned within said first and second paths between said beamsplitter means and said Q-switch means for mulitplying the frequency of light of said first wavelength and second component to produce



light along said first and second paths of a second wavelength and of the second component;

third reflection means highly reflective to said first wavelength and highly transmissive to said second wavelength angularly positioned to first and second paths and between said beamsplitter and said frequency multiplier means for reflecting the light of said second wavelength in one direction along parallel third and fourth paths angularly displaced from said first and second paths; and

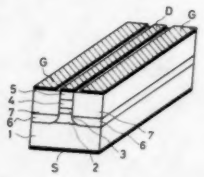
synchronizing means connected for sequentially energizing said laser means and said Q-switch means.

4,408,330

FIELD EFFECT SEMICONDUCTOR LASER, METHOD OF MODULATION THEREOF

Seiji An, 10-3, Nishiawaji 4-chome, Higashiyodogawa-ku; Osaka City, 533, Japan, assignor to Kabushiki Kaisha Towa Giken and Seiji An, both of Osaka, Japan, part interest to each

Filed Dec. 5, 1980, Ser. No. 213,333
Claims priority, application Japan, Dec. 7, 1979, 54-159460
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **28 Claims**



1. A field effect semiconductor laser comprising:

a semiconductor substrate,

a stripe-shaped mesa part of a double heterostructure including a first clad layer, an active layer, and a second clad layer on the top face of said semiconductor substrate in this order, both of said first and said second clad layers having lower refractive indices than that of said active layer,

buried layers buried in both side parts of said stripe-shaped mesa part on said semiconductor substrate,

electrodes provided on the bottom surface of said semiconductor substrate and on said second clad layer,

characterized in that

said active layer has the same conductivity type as that of said first clad layer, light reflecting faces at both ends thereof being cleavage planes of (011),

that each of said buried layers comprises a first buried layer formed on said semiconductor substrate and a second buried layer thereon where said first and said second

buried layers have conductivity types different from each other so that these buried layers are reverse-biased when a voltage of the same direction as the forward direction of a voltage to be applied to said stripe-shaped mesa part is applied to said second buried layer,

that a carrier concentration of said second buried layers is lower than that of said first buried layers,

that said first buried layers are formed in a manner that junction interfaces between said first and said second buried layers are disposed lower by a predetermined level difference than a junction place between said first clad layer and said active layer, and

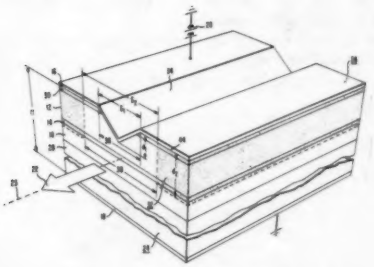
that an electrode is formed on at least one of said second buried layers.

4,408,331

V-GROOVE SEMICONDUCTOR LIGHT EMITTING DEVICES

Robert L. Hartman, Warren; Louis A. Koszi, Scotch Plains, and Bertram Schwartz, Westfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1981, Ser. No. 247,627
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—46 **19 Claims**



12. A double heterostructure semiconductor laser comprising

a semiconductor body having a major surface and including first and second cladding layers and an active layer therebetween,

electrode means for applying pumping current to flow from said surface through said active layer, thereby resulting in the emission of stimulated radiation from said active layer,

optical feedback means for resonating said radiation along an axis parallel to said layers, and

means for constraining said pumping current to flow in a channel from said major surface through said active layer, said constraining means comprising

V-groove first means for causing said current to flow in a relatively narrow upper channel which extends from said major surface to a depth short of said active layer, and

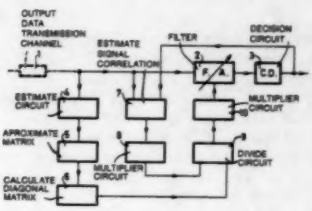
second means for causing said current to flow in a relatively wider lower channel which extends from at least said depth through said active layer.

4,408,332

ADAPTIVE SYSTEM IN A DIGITAL DATA RECEIVER PROVIDING COMPENSATION FOR AMPLITUDE AND PHASE DISTORTIONS INTRODUCED BY A DATA TRANSMISSION CHANNELS

Hikmet Sari, Alfortville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1981, Ser. No. 260,617
Claims priority, application France, May 14, 1980, 80 10862
Int. Cl.³ H03H *21/00*
U.S. Cl. 375—14 **3 Claims**



1. In a digital data receiver, an adaptive system providing compensation for amplitude and phase distortions introduced by a data transmission channel and comprising an adaptive equalizing circuit receiving a signal vector X_k from the data transmission channel output and producing an output signal y_k, and a decision circuit receiving this output signal y_k and producing an estimation $\hat{s}_{k-d}$ of each one of the digital data s_{k-d} applied to the data transmission channel input, characterized in that the adaptive equalizing circuit is a non-recursive transversal filter having N adjustable weighting coefficients and the adaptive system comprises for the direct determination of these coefficients:

a first circuit for determining, in an estimated matrix A^e of the square signal autocorrelation matrix $A=E(X_k.X_k{}^{TR})$ where E is the expectation operator and $X_k{}^{TR}$ is the transpose of X_k, the (N/2+1) first elements ($a_0{}^e$, $a_1{}^e$, $a_2{}^e$, ... $a_{N/2}{}^e$) of the first row if N is even, or the (N+1)/2 first elements ($a_0{}^e$, $a_1{}^e$, $a_2{}^e$, ... $a_{(N-1)/2}{}^e$) of the first row if N is odd, over an interval equal to a predetermined number M of data symbol periods of duration T on the basis of the relation

$$A^e = \frac{1}{M} \sum_{i=1}^{i=M} X_i \cdot X_i{}^{TR},$$

a second circuit connected to said first circuit for forming a vector $U=(r_0{}^e, r_1{}^e, r_2{}^e, \ldots r_{N-2}{}^e, r_{N-1}{}^e)$ in which $r_i{}^e=a_i{}^e$ for every i not exceeding N/2 if N is even, or not exceeding (N−1)/2 if N is odd, and $r_i{}^e=a_{N-i}{}^e$ for every i exceeding said limits,

a third circuit connected to said second circuit for forming a vector $\Lambda^e=(\lambda_0{}^e, \lambda_1{}^e, \lambda_2{}^e, \ldots, \lambda_{N-1}{}^e)$, whose components are the eigenvalues of a circulant matrix having said vector U as a first row, with the aid of the relation

$$\Lambda^e = \sqrt{N} \cdot P \cdot U^{TR}$$

where U^{TR} is the transpose of U and P is the unitary matrix of the order N defined by

$$P=||P_{fg}|| (f,g=0, 1, 2, \ldots, N-2, N-1)$$

and

$$P_{fg} = \frac{1}{\sqrt{N}} \exp[j\,2\pi\, f_g/N],$$

a fourth circuit connected to the data transmission channel output and the decision circuit output for determining an estimation V^e of the signal correlation vector $V = E(X_k \hat{s}_{k-d})$ in accordance with the relation

$$V^e = \frac{1}{M} \sum_{i=1}^{i=M} X_i s_{i-d},$$

a fifth circuit connected to said fourth circuit for multiplying said estimated vector V^e by the complex conjugate P^{cc} of said unitary matrix P,

a sixth circuit connected to said fifth and third circuits for dividing the vector $Q = P^{cc}.V^e$ at the output of said fifth circuit by said vector Λ^e at the output of said third circuit on a term-by-term basis so that the resulting vector $F = (f_0, f_1, f_2, \ldots f_{N-1}) = Q/\Lambda^e$ has components $f_i = q_i/\lambda_i^e$ for every i not exceeding $N-1$,

a seventh circuit connected to said sixth circuit for multiplying said vector F by said unitary matrix P, the resulting vector P.F is the estimate of the vector C^R constituting an approximation of the vector of the N optimum weighting coefficients of said transversal filter and being applied to said transversal filter for adjusting the weighting coefficients.

4,408,333

DATA ACQUISITION CIRCUIT

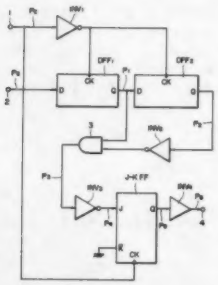
Yasuhiko Fujii, Yamato, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 12, 1982, Ser. No. 338,995

Claims priority, application Japan, Jan. 13, 1981, 56-3104[U]

Int. Cl.³ H03B *12/00;* **H04L** *7/00*

U.S. Cl. 375—95 **3 Claims**



1. A data acquisition circuit adapted to receive information data, a synchronization pulse and a clock pulse, the clock pulse at a repetition rate twice as high as the transmission rate of said information data, said circuit comprising:

means responsive to said synchronization pulse and said clock pulse for generating a conditioning pulse of which the duration is twice as large as the duration of said clock pulse and the leading edge occurs at a time delayed from the synchronization pulse by the duration of said clock pulse; and

a divide-by-two frequency divider responsive to said conditioning pulse and said clock pulse for generating a data acquisition pulse occurring at one half the rate of said clock pulse.

4,408,334

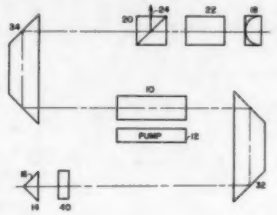
WAVEPLATE FOR CORRECTING THERMALLY INDUCED STRESS BIREFRINGENCE IN SOLID STATE LASERS

Eric A. Lundstrom, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 13, 1981, Ser. No. 243,416

Int. Cl.³ H01S *3/08*

U.S. Cl. 372—98 **7 Claims**



1. A method of correcting for thermally induced stress birefringence in a laser resonator using a pair of Porro prisms to define the ends of said laser resonator, said birefringence referring to the splitting of a beam of light into two components which travel at different velocities within said laser resonator, the faster orientation defining a fast axis angle, θ_w, and the difference between the two components defining a phase advance angle, ρ_w, transmission of a beam of light described by a polarization transmission matrix containing 2×2 matrix elements, comprising the steps of:

evaluating a corrective polarization transmission matrix which if added to said laser resonator would eliminate birefringence in said laser resonator;

producing a waveplate with said corrective polarization transmission matrix; and

inserting said waveplate in said laser resonator.

4,408,335

METHOD AND APPARATUS FOR CONTROLLING TAPE TRANSPORT APPARATUS FOR CASSETTES

Stephane M. d'Alayer de Costemore d'Arc, and David J. Lockey, both of Brussels, Belgium, assignors to Staar S. A., Belgium

Division of Ser. No. 953,211, Oct. 20, 1978. This application Feb. 6, 1981, Ser. No. 232,364

Claims priority, application France, Dec. 9, 1977, 7737210

Int. Cl.³ B65H *59/38, 77/00;* **H02P** *5/46, 7/68*

U.S. Cl. 377—18 **10 Claims**

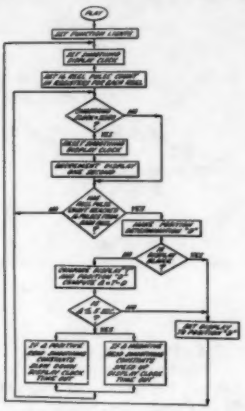
1. The method of synchronizing a display of tape position in a tape transport apparatus with actual tape movement from reel to reel by operating said display by a display clock having an adjustable rate,

determining successive tape positions based on the speeds of said reels,

periodically comparing a determined position with the tape position indicated by said display and providing signals representing the magnitude and sense of any difference, and

increasing or decreasing the rate of said display clock in accordance with the magnitude and sense of any such

difference represented by said signals to reduce any such difference over a prolonged interval, thereby smoothing



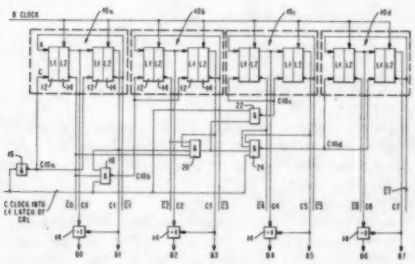
the operation of the display and maintaining the display in synchronization with actual tape movement.

4,408,336

HIGH SPEED BINARY COUNTER

Sumit DasGupta, Wappingers Falls, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed May 4, 1981, Ser. No. 259,878
Int. Cl.³ H03K *23/08*
U.S. Cl. 377—34 **4 Claims**



1. A binary counter comprising,

N two stage Gray code counters each capable of generating a two bit gray code count,

circuit means coupling said N two stage Gray code counters together for generating a 2N digit pseudo gray code count, $C_0, C_1, \ldots, C_{2N-1}$,

N Exclusive OR means each for Exclusive ORing each odd and even bit output position of every N two stage Gray code counter together and,

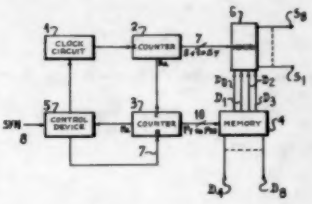
binary output means for generating a 2 N digit binary count $B_0, B_1, \ldots B_{2N-1}$ including means for using the output of the second stage of the two stage Gray code counters as the bits $B_1, B_3, B_5, \ldots, B_{2N-1}$ in the binary count and the output of the Exclusive OR circuits as the bits $B_0, B_2, B_4, \ldots, B_{2N-2}$ in the binary count whereby the pseudo Gray code count is converted to a binary count.

4,408,337

TELEVISION BASE SIGNAL AND TEST SIGNAL GENERATOR

Luc Pham Van Cang, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 20, 1981, Ser. No. 236,631
Claims priority, application France, Feb. 26, 1980, 80 04207
Int. Cl.³ H04N *7/02*
U.S. Cl. 377—44 **3 Claims**



1. A generator of television base signals and test signals comprising:

a first memory with p memory zones each having q memory cells (p and q being positive whole numbers), each cell storing an assembly of bits defining entirely, for a quantum of time T_0, the amplitude of base signals and test signals able to be generated, said first memory having a first and a second address input and an output;

a second memory with t memory cells (t being a positive whole number), each cell storing a binary number which is the address of a memory zone of the first memory, this second memory having an address input and having an output coupled to the first address input of the first memory;

a first counter having an output coupled to the address input of the second memory for reading successively its t memory cells;

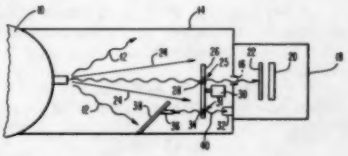
a second counter having an output coupled to the second address input of the first memory for reading, at a frequency $1/T_0$, the memoory cells of the memory zone associated with the binary number delivered by the second memory.

4,408,338

PULSED ELECTROMAGNETIC RADIATION SOURCE HAVING A BARRIER FOR DISCHARGED DEBRIS

Warren D. Grobman, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,468
Int. Cl.³ G03C *5/16*
U.S. Cl. 378—034 **13 Claims**



12. A barrier for debris discharged from a pulsed electromagnetic radiation source, comprising:

a shutter located in the path of the electromagnetic radiation and sufficiently far from the source of said radiation such that a pulse of electromagnetic radiation and simultaneously discharged debris become separated from each

other and arrive at said shutter at different times due to an inherent difference in propagation speed; and

means for synchronizing generation of an electromagnetic radiation pulse with movement of said shutter such that said shutter is open when the electromagnetic pulse arrives at said shutter, said shutter thereby passing said electromagnetic radiation pulse and said shutter is closed when the simultaneously discharged debris arrives at said shutter, said shutter thereby blocking propagation of said debris.

4,408,339

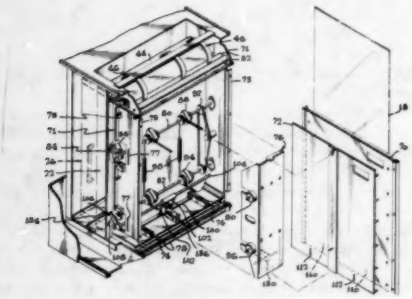
COMPACT X-RAY UNIT

Gunter Schmidt, Malibu, Calif., assignor to Xonics, Inc., Des Plaines, Ill.

Filed Feb. 12, 1981, Ser. No. 233,995

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—173 **8 Claims**



1. An X-ray system comprising:

a supply cassette which includes a feedout roller;

an exposure unit;

means for guiding a film sheet along a path between said cassette and said exposure unit;

a pair of transport rollers disposed along said path to grip a film sheet between them;

motor and transmission means coupled to said rollers to turn them;

said transmission means constructed to turn said transport rollers at a faster peripheral speed than said feedout roller, and said transmission means including an overrunning clutch means which enables said feedout roller to be rotated by a film pulled thereby at a greater speed than said transmission tends to rotate said feedout roller, whereby to permit a film engaged by both feedout and transport rollers to be smoothly moved between them.

4,408,340

MEANS FOR HOLDING X-RAY FILMS

Walter Bauer, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

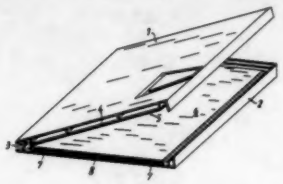
Filed Oct. 21, 1980, Ser. No. 199,378

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943853

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—187 **3 Claims**

1. An arrangement for holding sheet-like X-ray films comprising a support; a magnetic layer and an intensifier screen provided on said support; and a flexible laminate secured to said support, said laminate including a ferromagnetic layer and a flat receptacle for said ferromagnetic layer, said receptacle comprising a second intensifier screen at one side of said ferromagnetic layer, a protective layer at the other side of said ferromagnetic layer and means for securing said second screen to said protective layer, wherein at least one of said layers is movable toward and away from the other of said layers to press a film which is placed between said receptacle and said



screen against such screen when said ferromagnetic layer is sufficiently close to said magnetic layer to be attracted by the latter.

4,408,341

X-RAY EXAMINATION APPARATUS HAVING A MOVABLE X-RAY SOURCE

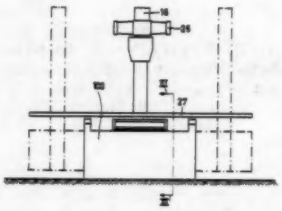
Dieter Christiansen, Schönberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 127,713, Mar. 6, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,359

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908914

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—196 **7 Claims**



1. X-ray examination apparatus comprising:

a frame;

a patient examination table, slidably connected to the frame;

a guide rail extending in a longitudinal direction;

a column, movable on the guide rail in the longitudinal direction; and

an X-ray source on the column;

characterized in that the apparatus further comprises:

a carriage, movable on the frame in the longitudinal direction, the guide rail being movable on the carriage in the longitudinal direction; and

linkage means for assuring that when the carriage, the guide rail, or the column are moved relative to the frame, the guide rail is moved in the same direction as the carriage but at twice the distance relative to the frame, and the column is moved in the same direction as the carriage but at three times the distance relative to the frame.

4,408,342

METHOD FOR RECOGNIZING A MACHINE ENCODED CHARACTER

John S. Grabowski, Kitchener, Canada; Chin-Chih Shiau, Chelmsford, Mass., and John R. Latala, Waterloo, Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 16, 1981, Ser. No. 254,838

Int. Cl.³ G06K *9/34*

U.S. Cl. 382—9 **14 Claims**

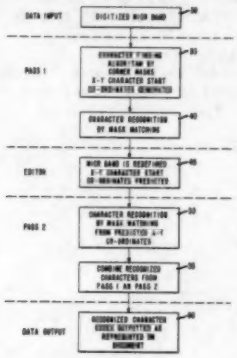
1. A method for optically reading and determining machine-

encoded characters from a printed document, said method comprising the steps of:

(a) scanning an area of said printed document to generate digitized data;

(b) storing said digitized data;

(c) analyzing said digitized data for ascertaining the existence of apparent determinable characters and an associated starting location for each apparent determinable character;



(d) storing the starting locations in a location table;

(e) determining on a first pass the machine encoded character for each starting location stored in the location table;

(f) editing the location table for predicting the probable starting locations of additional characters, including blanks; and

(g) determining on a second pass additional characters and blanks based upon the predicted probable starting locations of additional characters and blanks.

4,408,343

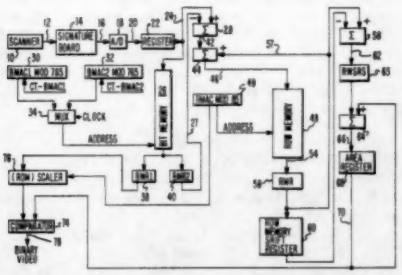
IMAGE ENHANCEMENT FOR OPTICAL CHARACTER READERS

Jimmie Neill, Walled Lake; Nathaniel Webb, Detroit, and Norman F. Hartig, Berkley, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 27, 1981, Ser. No. 238,972

Int. Cl.³ G06K *9/36*

U.S. Cl. 382—52 **9 Claims**



1. In an image enhancement device providing digital video signals representing pixels of a character, means for enhancing said digital video signals, comprising:

memory means coupled to receive and store said digital video signals, where a group of signals represents the reflectance of a pixel;

groups of said signals including active groups of signals and inactive groups of signals where the active groups represent active pixels from areas containing characters and the inactive groups represent inactive pixels corresponding to blank spaces without characters, said inactive groups of signals being formed solely as groups of zeros;

means coupled to said memory means to extract digital video signals representing the reflectance of the central pixel in a given matrix of pixels to provide a central value;

summing means coupled to sum active signals representing the reflectances of all the active pixels in said given matrix to provide a matrix value;

means coupled to receive and scale the central value in accordance with the number of active pixels in the matrix to provide a scaled value; and

means for comparing said scaled value with said matrix value and generating a binary video output which is maximized when said scaled value is greater than said matrix value and minimized when said scaled value is less than said matrix value.

4,408,344

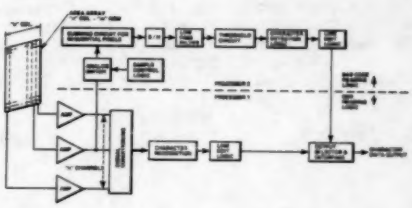
OCR AND BAR CODE READER USING MULTI PORT MATRIX ARRAY

Lynn D. McWaters, Garland, and Medford D. Sanner, Irving, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Apr. 9, 1981, Ser. No. 252,554

Int. Cl.³ G06K *9/28*

U.S. Cl. 382—62 **2 Claims**



1. An optical reader for reading alphanumeric and bar code characters using a single area array of photo sensitive diodes wherein there are at least two columns in the array and each column has a plurality of photo sensitive diodes such that the column exceeds in length the height of the character being read, comprising; means for reading the electrical signals for each photo diode in a column sequentially, means for reading the sequential electrical signals for each column in parallel with the signals in all the columns, means for selecting part of the signals from one of the columns and summing the selected signals for one or more scans to identify therefrom bar code characters being scanned, means for utilizing electrical signals from all of the columns to identify alphanumeric characters being scanned, and mdeans to identify which type of character is being read, bar code or alphanumeric, and out putting signals representative of the read characters.

4,408,345

REMOTE LINE MONITORING METHOD AND DEVICE FOR CATV SYSTEM

Kenji Yashiro, and Toshio Tabata, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,699

Claims priority, application Japan, Jun. 21, 1979, 54-78308

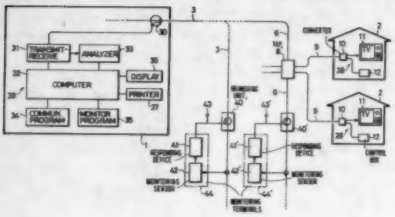
Int. Cl.³ H04B *3/46*

U.S. Cl. 455—3 **6 Claims**

1. A remote line monitoring device for a CATV system in which a single center facility is connected to a plurality of terminal units through cables to transmit television signals through the cables to the terminal units comprising:

a plurality of monitoring units each having a unique identifying address for monitoring line conditions provided at predetermined points along said cables intermediate said center facility and said terminal units; and

a central monitoring system for transmitting and receiving data provided in said center facility;



said central monitoring system comprising means for calling said monitoring units with said individual addresses assigned thereto to cause said monitoring units to transmit data relating to line conditions to said central monitoring system, and means for receiving said data from said monitoring units.

4,408,346

KEY ASSEMBLY

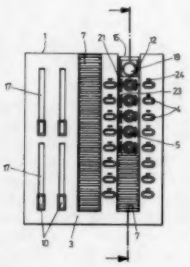
Karl-Heinz Bauer, Bad Neustadt, Fed. Rep. of Germany, assignor to Preh Elektrofeinmechanische Werke Jakob Preh, Bad Neustadt, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,660

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039402

Int. Cl.³ H04B *1/08*

U.S. Cl. 455—175 **5 Claims**



1. Channel selecting and voltage divider presetting apparatus for high frequency receivers of the type used particularly for broadcasting and television sets, comprising

a housing provided with mutually releasable push buttons for switching on storable, selectively adjustable electrical values of channel memories,

a plurality of rotary and depressible press buttons associated with respective ones of said push buttons for channel tuning and optionally for selecting a frequency range which is adjustable, said housing having a recess and said press buttons being positioned within said recess,

a flexible ribbon slidable in and normally covering said recess, which ribbon is provided with an operating member integrally formed therewith, said recess having tongue guide means extending on opposite sides thereof and said ribbon having associated grooves on opposite sides thereof, said tongue guide means being engaged in said grooves so as to guide said ribbon in moving through said recess, and

an aperture at one end of said recess permitting said ribbon to be introduced, and deflecting means at the other end of said recess for deflecting said ribbon relative to said recess.

4,408,347

HIGH-FREQUENCY CHANNEL SELECTOR HAVING FIXED BANDPASS FILTERS IN THE RF SECTION

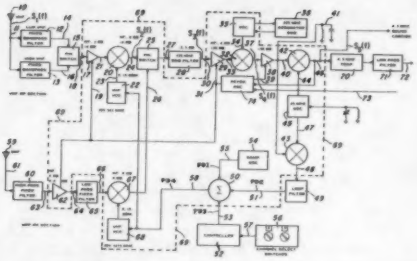
Darrell L. Ash, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 29, 1977, Ser. No. 813,198

The portion of the term of this patent subsequent to Jul. 24, 1996, has been disclaimed.

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—179 **22 Claims**



1. In a channel selector for a television receiver including a radio frequency section and an intermediate frequency section, the combination comprising:

fixed bandpass filter means disposed in the radio frequency section, said fixed bandpass filter means including a plurality of fixed bandpass filters, each of said fixed bandpass filters having at least one unalterable predetermined frequency passband for receiving radio frequency signals representative of a plurality of television channels and for filtering at least one fixed frequency spectrum of television channels from the received signals; and

at least one mixing means connected to the output of said fixed bandpass filter means, said mixing means including a metal semiconductor field effect transistor and having first and second inputs coupled to simultaneously receive said fixed frequency spectrum of television channels from said fixed bandpass filter means and mixing signals of a selected intermediate frequency for frequency shifting a selected channel from said fixed frequency spectrum of television channels to a high intermediate frequency substantially greater than 45 MHZ.

4,408,348

MULTIBAND TUNING SYSTEM FOR A TELEVISION RECEIVER

Gerald E. Theriault, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,133

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—180 **18 Claims**

1. A multiband tuning system for producing an IF signal from RF signals residing in, in the order named, a first broadcast band, a first cable band, a second broadcast band, a second cable band, and a third broadcast band comprising:

control means for generating a tuning signal having a magnitude determined by the frequency of a selected channel;

first filter means for selecting RF signals corresponding to channels selected in a first tuning band including said first

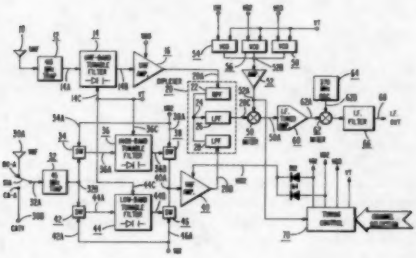
broadcast band and a lower frequency portion of a said first cable band in response to said tuning signal;

second filter means for selecting RF signals corresponding to channels selected in a second tuning band including a higher frequency portion of said first cable band, said second broadcast band and at least the lower frequency portion of said second cable band in response to said tuning signal;

filter selection means for enabling the operation of said first filter means when the selected channel is in said first tuning band and for enabling the operation of said second filter means when the selected channel is in said second tuning band wherein said filter selection means includes:

an input node at which the signals in said first and second tuning bands are received and an output node,

first and second diode means respectively connecting respective input connections of said first and second filter means to said input node,



third and fourth diode means respectively connecting respective output connections of said first and second filter means to said output node, and

second control means for rendering said first and third diode means conductive when said selected channel is within said first tuning band and for rendering said second and fourth diode means conductive when said selected channel is within said second tuning band;

third filter means for selecting RF signals corresponding to channels selected in a third tuning band including said third broadcast band;

combining means for combining RF signals selected by the enabled one of said first and second filter means and RF signals selected by said third filter means;

local oscillator means for generating a local oscillator signal, the frequency of which is responsive to said tuning signal; and

mixing means for translating the frequency of the combined RF signal from said combining means in response to said local oscillator signal to produce said IF signal.

4,408,349

RECEIVER PROVIDED WITH A FREQUENCY SYNTHESIZER CAPABLE OF STORING FINE TUNING INFORMATION

Tatsuo Yukawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

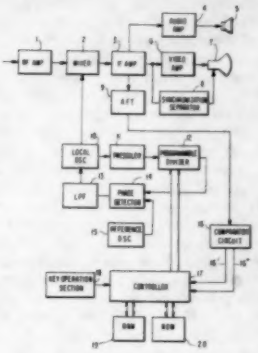
Filed Jul. 16, 1981, Ser. No. 283,858

Claims priority, application Japan, Jul. 22, 1980, 55/103442[U]

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—182 **9 Claims**

1. A receiver comprising a first set of keys, a second set of keys, means coupled to said first set of keys for producing an address signal corresponding to a channel number designated by operation of at least one key of said first set, a first memory device storing frequency-division ratio data for each designatable channel number, a second memory device storing fine tuning data for varying said frequency-division ratio data, means coupled to said producing means and said first and second memory devices for applying the address signal produced by said producing means to said first memory device and at the same time to said second memory device to read out both said frequency-division ratio data and said fine tuning data corresponding to the designated channel number from said first and second memory devices, a frequency divider, means coupled to said first and second memory devices for



generating a new frequency-division ratio data to be set into said frequency divider in response to said frequency-division ratio data and said fine tuning data corresponding to said designated channel number, means responsive to said new frequency-division ratio data set into said frequency divider for providing a local oscillation signal, and means responsive to operation of at least one of said second set of keys for storing a fine tuning data in said second memory device.

4,408,350

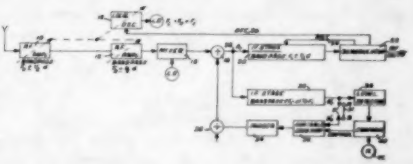
ENHANCED SELECTIVITY SIGNAL RECEIVER

Erwin Donath, 40, Balcourt Dr., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 350,335, Feb. 12, 1982. This application Nov. 30, 1982, Ser. No. 445,725

Int. Cl.³ H04B *1/12*

U.S. Cl. 455—206 **20 Claims**



20. In a reception system including a receiver having a plurality of interconnected stages including a front stage and a demodulator, said demodulator having a predetermined amplitude threshold sensitivity, there appearing at an input of said receiver a desired signal occupying substantially a predetermined bandwidth, and at least one undesired signal occupying a bandwidth different from, though partially overlapping said predetermined bandwidth, said receiver including receiver terminal means operatively located upstream of said demodulator, each signal having a characteristic high frequency spectrum, the spectrum of said desired signal, and at least a fraction of the spectrum characteristic of said undesired signal appearing across said receiver terminal means, at least remnants of said undesired signal still appearing at the input of said demodulator, said demodulator being normally capable of demodulating each of said signals, but requiring at least a prearranged level difference between said signals at its input to demodulate

said desired signal at an acceptable signal-to-noise ratio, the improvement comprising, in combination therewith,

signal selector means coupled to said receiver terminal means for normally continuously selecting the stronger of said signals appearing across said receiver terminal means,

gain-controlled feedback means with one input connected to an output of said signal selector means for negatively feeding back to said receiver terminal means said undesired signal substantially 180° out of phase with said spectrum characteristic of the undesired signal when said undesired signal is the stronger of said signals,

said signal selector including frequency-dependent selection means for selecting said undesired signal, so as to substantially isolate it from any other signals, said undesired signal having at an output of said frequency-dependent selection means a measurable output level,

comparator means for comparing said output level of said undesired signal at said frequency dependent selection means at least with a reference level, and for generating at least one error control signal, said one error control signal feeding another input of said gain-controlled feedback means, said reference level being settable over a wide and non-critical range so as to force said remnants of said undesired signal still appearing at the input of said demodulator to assume, through said error control signal, a controlled level below a level of said desired signal thereat, and differing from said level of said desired signal by at least said level difference, selection of said desired signal by said signal selector means being substantially not affected by the relative amplitude of the desired signal with respect to said undesired signal, from a received desired signal level sufficient to reach said predetermined threshold sensitivity up to when at least said front stage is overloaded due to a signal of excessive signal strength being received by said receiver, whereby, despite the presence of any controlled level of said remnants of said undesired signal upstream of said demodulator, demodulation of said undesired signal by said demodulator is prevented, and

inhibiting means connected to said feedback means for inhibiting operation of said feedback means,

said comparator means including comparison means having an output, and being connected with one input thereof to an output of one of said stages, and with another input thereof to the output of said frequency-dependent selection means, the output of said comparison means being connected to said inhibiting means, and providing another error control signal adjusted to inhibit operation of said feedback means when said desired signal is the stronger of said signals, whereby feedback of the desired signal is prevented.

4,408,351

DIRECTLY MIXING RECEIVING SYSTEM

Robert Maurer, Saarbrücken; Alfons Blum, Schiffweiler-Heiligenwald, and Michael Hoffmann, Saarbrücken, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

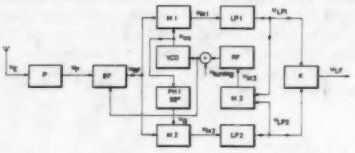
Filed Jan. 25, 1980, Ser. No. 115,213

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1979, 2902952

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—260 **21 Claims**

1. A directly mixing broadcast signal receiving system, in which a received modulated high frequency signal is directly demodulated into a demodulated low frequency base band signal by mixing with a synchronized local oscillator signal, said system including a phase control loop comprising a first mixer having first and second inputs and an output and arranged to provide at said output a signal proportional to the algebraic product of the signals applied to said first and second inputs and including high frequency and low frequency components, means connected for delivering the received modulated high frequency signal to said first input of said first mixer, a voltage controlled oscillator having an input and an output, with said output being connected for supplying to said second input of said first mixer an alternating voltage of substantially constant amplitude and having a frequency which is a function of the voltage at said oscillator input, a first lowpass filter connected to said output of said first mixer for providing a filtered output signal representative of said first mixer output signal with the high frequency component of said first mixer output signal substantially suppressed, and means for applying the filtered output signal of said first lowpass filter to said input of said voltage controlled oscillator, wherein said first mixer



comprises means for decoupling its output signal from said first input, said first mixer and first lowpass filter comprise means for suppressing all frequency components other than that of the algebraic product of the signals to be mixed, said voltage controlled oscillator is constructed to be tuned over a predetermined band of high frequencies to be received, the output signal of said voltage controlled oscillator is substantially sinusoidal and the mixed output signal produced by said first mixer is low in harmonics, whereby the received modulated high frequency signal is directly demodulated by said phase control loop without the aid of an intermediate frequency signal.

4,408,352

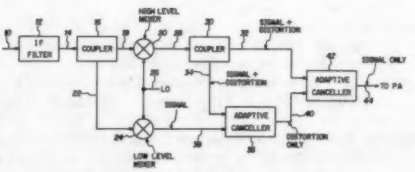
HIGH POWER LEVEL MIXER APPARATUS

Charles H. Dudding, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 10, 1982, Ser. No. 376,858

Int. Cl.³ H04B *1/12*

U.S. Cl. 455—295 **4 Claims**



2. The method of reducing intermodulation distortion in a high power level mixer comprising the steps of:

mixing a source signal with a local oscillator signal to provide a high power level signal including primarily desired mixed signals and distortion signals;

mixing an attenuated version of the source signal with the local oscillator signal to provide a low power level signal including primarily a substantially distortion-free mixed signal;

combining an attenuated version of said high power level mixed signals plus distortion signals with the low power level, substantially distortion-free signal to provide an output comprising primarily distortion signal differences; and

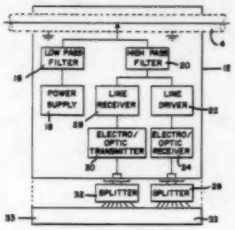
combining the high power level signal including primarily the mixed signals plus distortion signals with the signal comprising primarily distortion signals differences only to provide an output high level signal with relatively insignificant distortion signal levels.

4,408,353

COAXIAL CABLE/FIBER OPTIC BUS NETWORK

Terry P. Bowen, Etters; George J. Lawrence, Mechanicsburg, and Lawrence G. Wiley, Camp Hill, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 17, 1980, Ser. No. 198,029
Int. Cl.³ H04B 9/00
U.S. Cl. 455—608 3 Claims



1. A network system for distributing digital information comprising:

a coaxial line for bussing a main data signal at relatively high frequencies and bussing power at relatively low frequencies;

at least one tap means for electrically interfacing with said coaxial line, comprising:

a. receiving means for sampling said main signal, said receiving means including transducing means for transforming said sampled main signal into a light signal for output, and optical splitting means for changing said light signal output into a multiple output for distribution to multiple peripheral machines;

b. driving means including optical transducing means for changing light signal inputs from said multiple peripheral machines into an electrical input signals, and means for driving a signal along said coaxial line in response to said electrical input signals, and switching means for connecting and disconnecting said driving means from said coaxial line; and

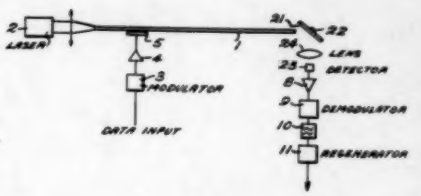
c. conversion means responsive to said power frequencies for supplying operating power to said receiving and driver means.

4,408,354

SIGNAL TRANSMISSION SYSTEMS

Brian Culshaw, Amersham; Peter R. Ball, Garston; Stuart A. Kingsley, London, and David E. N. Davies, Hemel Hempstead, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 9, 1981, Ser. No. 223,724
Claims priority, application United Kingdom, Jan. 14, 1980, 8001212
Int. Cl.³ H04B 9/00
U.S. Cl. 455—610 12 Claims



1. A signal transmission system comprising:

means for propagating coherent light along a multimode optical fibre waveguide;

modulation means for impressing phase-modulation signals in said waveguide and allowing the impressed signals in different modes to interfere in the waveguide so that an amplitude modulated signal is generated which is subject to random fading across the waveguide;

means provided at the output of the waveguide for inducing intermodal phase-modulation of the amplitude modulated signals from different parts of the cross-section of the waveguide to derive a single optical modulated signal in which the random fading is neutralized; and

detector means comprising a single photodetector to which the said single optical modulated signal is applied.

DESIGN PATENTS

GRANTED OCT. 4, 1983

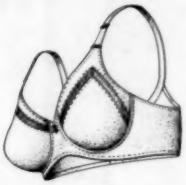
ERRATA

For CLASS	See PATENT NO.
D15–070	270,793

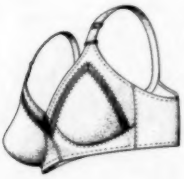
DESIGNS

OCTOBER 4, 1983

270,774
BRASSIERE OR THE LIKE
Harold Stern, Wyckoff, N.J., and Elisabeth Suleiman, Newark, Del., assignors to International Playtex, Inc., Stamford, Conn.
Filed Jun. 2, 1981, Ser. No. 269,913
Term of patent 14 years
Int. Cl.[3] D2—*01*
U.S. Cl. D2—24

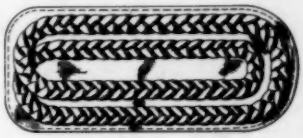


270,775
BRASSIERE OR THE LIKE
Harold Stern, Wyckoff, N.J., and Elisabeth Suleiman, Newark, Del., assignors to International Playtex, Inc., Stamford, Conn.
Filed Jun. 2, 1981, Ser. No. 269,914
Term of patent 14 years
Int. Cl.[3] D2—*01*
U.S. Cl. D2—24



270,776
UPPER TORSO PROTECTOR FOR MOTORCYCLISTS AND THE LIKE
Chris R. Dawson, 9154 Irvington Ave., San Diego, Calif. 92123
Filed Jul. 6, 1981, Ser. No. 281,026
Term of patent 14 years
Int. Cl.[3] D2—*02*
U.S. Cl. D2—27

270,777
THONG-TYPE SHOE
N. Nancy Nakagawa, 11598 Gladstone Cir., Fountain Valley, Calif. 92708
Filed Sep. 11, 1981, Ser. No. 301,325
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—270



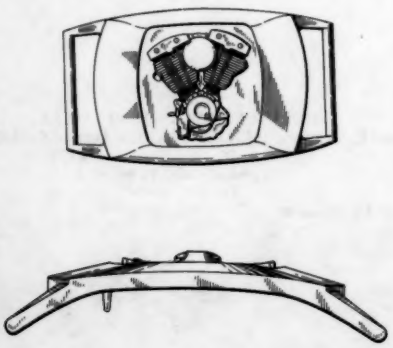
270,778
TENNIS SHOE
Gino Casetta, Pontelongo, Italy, assignor to Simod Patents N.A. N.V., Curacao, Netherlands Antilles
Filed Nov. 12, 1980, Ser. No. 206,165
Claims priority, application Italy, May 16, 1980, 61936/80[U]
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

270,779
SHOELACE BOW KNOT RETAINER
John E. Steinberg, 10434 Corfu La., Los Angeles, Calif. 90024
Filed Apr. 16, 1981, Ser. No. 254,670
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—314

270,780
UNITARY SOLE
John F. Hlustik, London, England, assignor to The United States Shoe Corporation, Cincinnati, Ohio
Division of Ser. No. 11,727, Feb. 12, 1979. This application Mar. 10, 1980, Ser. No. 128,783
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

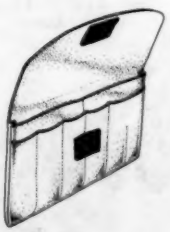
270,781
JEWELRY TIE
George A. Filmer, Jr., 1060 S. Franklin St., Denver, Colo. 80209
Filed Nov. 12, 1980, Ser. No. 206,030
Term of patent 14 years
Int. Cl. D02—*05*
U.S. Cl. D2—353

270,782
BELT BUCKLE
Thomas H. Rudd, Wayzata, Minn., assignor to Drag Specialties, Inc., Minneapolis, Minn.
Filed Jul. 22, 1981, Ser. No. 286,015
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

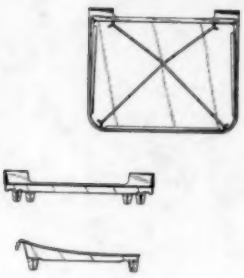


270,783
CROCHET HOOK
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed Jan. 26, 1981, Ser. No. 228,204
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D3—28

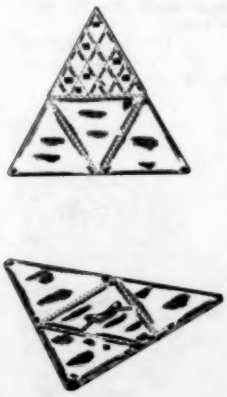
270,784
TEE POUCH FOR GOLFERS
John E. Forrester, P.O. Box 1264, Apopka, Fla. 32703
Filed Aug. 27, 1981, Ser. No. 297,039
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—37



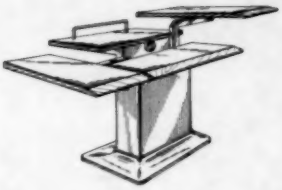
270,785
AUTOMOBILE SERVING TRAY
Robert W. White, 715 NW. 39th St., Oklahoma City, Okla. 73118
Filed Mar. 27, 1981, Ser. No. 248,554
Term of patent 14 years
Int. Cl. D03—*99*; D07—*99*
U.S. Cl. D3—40



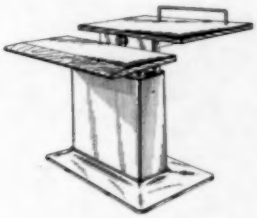
270,786
POUCH FOR CARRYING JEWELRY OR SIMILAR ARTICLES
Binns Handy, West Henrietta, and David O. Chase, Skaneateles, both of N.Y., assignors to Lenox, Incorporated, Lawrenceville, N.J.
Filed May 26, 1981, Ser. No. 267,375
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—75



270,787
COMBINED TABLE AND SIDE EXTENSION UNIT FOR SUPPORTING ELECTRONIC EQUIPMENT
Arthur H. Umanoff, Ardsley, and Alain Huin, Mount Kisco, both of N.N.Y., assignors to Hon Industries Inc., Muscatine, Iowa
Filed Jun. 10, 1981, Ser. No. 272,309
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—23



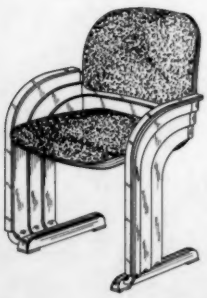
270,788
SUPPORT TABLE FOR ELECTRONIC EQUIPMENT
Arthur H. Umanoff, Ardsley, and Alain Huin, Mount Kisco, both of N.Y., assignors to Hon Industries Inc., Muscatine, Iowa
Filed Jun. 10, 1981, Ser. No. 272,377
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—23



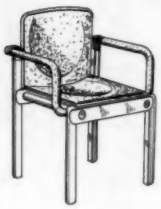
270,789
DISPLAY STAND OR SIMILAR ARTICLE
Russell Blanco, c/o Impulse Display, 457 Lonsdale Ave., Pawtucket, R.I. 02860, and Jeannie Bouchever, Cromwell Pl., Old Saybrook, Conn. 06475
Filed Mar. 18, 1981, Ser. No. 245,134
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28

270,790
ADJUSTABLE LOUNGE CHAIR
Rodrigo Rodriquez, Carimate, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Mar. 17, 1981, Ser. No. 244,749
Claims priority, application Italy, Sep. 18, 1980, 22822 B/80
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

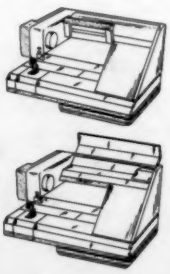
270,791
CHAIR
Gerd Lange, 6749 Kapsweyer, Fed. Rep. of Germany
Filed Nov. 6, 1980, Ser. No. 204,754
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



270,792
CHAIR
Gerd Lange, Kapsweyer, Fed. Rep. of Germany, assignor to Schlapp-Möbel GmbH & Co. KG, Neu-Anspach, Fed. Rep. of Germany
Division of Ser. No. D. 22,157, Mar. 20, 1979. This application Jan. 15, 1981, Ser. No. 225,406
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, MR 59
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



270,793
SEWING MACHINE
Willi Meier, Karlsruhe, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany
Filed Jun. 5, 1981, Ser. No. 270,919
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, MR VIII/161
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—70



270,794

COMBINED DISPENSING UNIT FOR SQUEEZING TOOTHPASTE TUBES AND HOLDER FOR TOOTHBRUSHES

Larry C. Bird, 3228 Garfield, Des Moines, Iowa 50317

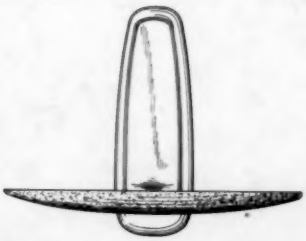
Filed Sep. 17, 1981, Ser. No. 303,033
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—87

270,795

SOAP DISH

Andre Bennato, Paris, France, assignor to Sanistyl Creations - S.A.R.L., Nogent sur Marne, France

Filed Sep. 25, 1980, Ser. No. 190,823
Claims priority, application France, Mar. 26, 1980, 800 981
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90



270,796

RETRACTABLE PLANT HANGER

Jeanne M. Quirico, P.O. Box 971, La Mesa, Calif. 92041

Filed Feb. 27, 1981, Ser. No. 238,913
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D6—113

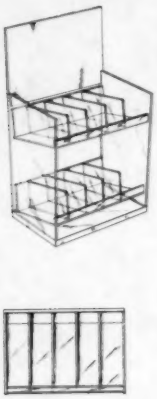
270,797

HANGER FOR ELONGATE ARTICLES

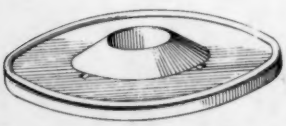
Gilles Marleau, 85 Brady St., Hull, Quebec, Canada J8Y 5L6

Filed Mar. 27, 1981, Ser. No. 248,065
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D6—125

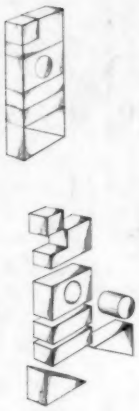
270,798
DISPLAY HOLDER
Donald P. McDiarmid, III, Honolulu, Hi., assignor to Ahi Paka, Limited, Honolulu, Hi.
Filed Feb. 9, 1982, Ser. No. 347,143
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—189



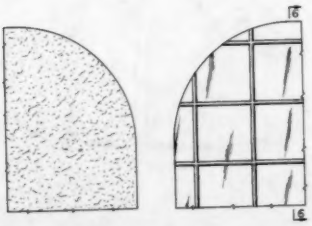
270,799
TABLE TOP
Edward J. Creske, P.O. Box 1520, Wausau, Wis. 54401
Filed Mar. 30, 1981, Ser. No. 249,141
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



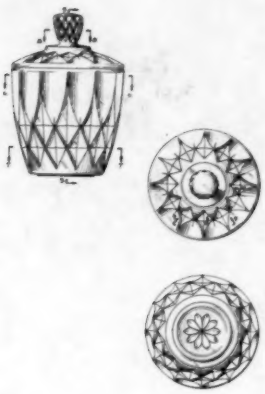
270,800
NESTING PLAY CUSHIONS
Joseph T. Fuller, 9977 Coca, Alta Loma, Calif. 91701
Filed May 15, 1981, Ser. No. 263,986
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



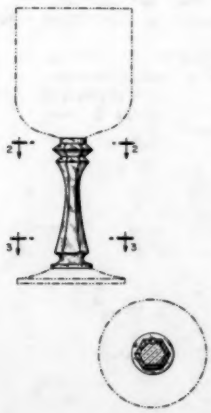
270,801
MAT
Frank Curatolo, 130 Overlook Ave., Hackensack, N.J. 07601
Continuation-in-part of Ser. No. 685,442, May 11, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,692
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—209



270,802
COVERED JAR OR SIMILAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 140,180, Apr. 14, 1980, Pat. No. Des. 267,697. This application May 6, 1982, Ser. No. 375,482
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—17

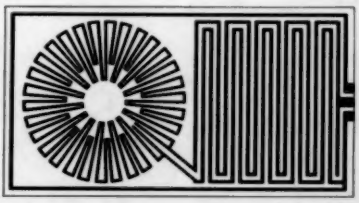


270,803
STEM FOR A GOBLET OR SIMILAR ARTICLE
William D. Gicking, Greensburg, Pa., and Heinz Frisch, Zwiesel, Fed. Rep. of Germany, assignors to American Stemware Corporation, Greensburg, Pa.
Filed Oct. 7, 1981, Ser. No. 309,617
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—39

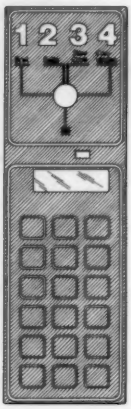


270,804
ICE CHEST
Thomas F. Caves, Tustin, Calif., assignor to John C. Swann, El Toro, Calif.
Filed Aug. 24, 1981, Ser. No. 295,745
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—77

270,805
ELECTRIC HEATING PLATE FOR A FOOD WARMER
Malcolm A. Goldsworthy, Whorlton, England, assignor to Schott Industrial Glass Limited, Newton Aycliffe, England
Filed May 28, 1981, Ser. No. 270,308
Claims priority, application United Kingdom, Apr. 21, 1981, 997807
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—363

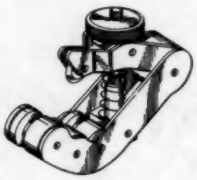


270,806
CONTROL PANEL FOR A COOKING DEVICE
Rex Notbohm, Boone County, Mo., assignor to Toastmaster Inc., Columbia, Mo.
Filed Aug. 17, 1981, Ser. No. 293,596
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—406

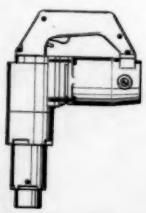


270,807
COMBINED BOTTLE CAP AND PULL TAB OPENER
Monte M. Dilliner, P.O. Box 177, Lineville, Iowa 50147
Filed Jun. 4, 1981, Ser. No. 270,229
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—18

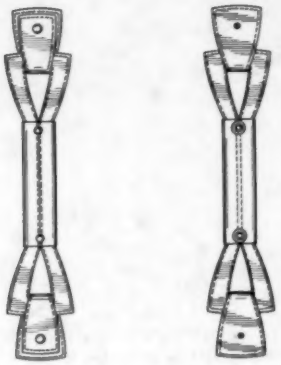
270,808
TUBING CUTTER
Glenn R. Wolcott, Americus, Ga., assignor to Wolcott Tool Company, Marietta, Ga.
Filed Feb. 5, 1981, Ser. No. 231,800
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—60



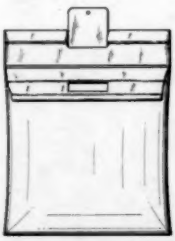
270,809
POWER WRENCH
Seiji Ikeda, Osaka, and Katsuyuki Ono, Moriguchi, both of Japan, assignors to Maeda Metal Industries, Ltd., Osaka, Japan
Filed Sep. 23, 1980, Ser. No. 190,044
Claims priority, application Japan, May 31, 1980, 55-21627
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—68



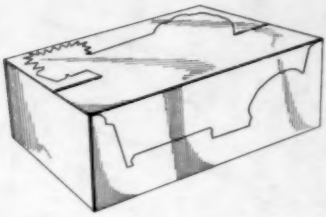
270,810
HANDLE UNIT FOR A LUGGAGE CASE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to CPG Products Corp., Minneapolis, Minn.
Filed May 4, 1981, Ser. No. 260,224
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—317



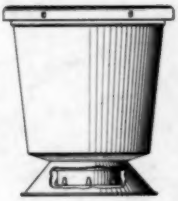
270,811
INSULATED CARRY BAG
Leif O. Skovgaard, 11 A Egelunden, Vrogum, DK-6840 Oksbol, Denmark
Filed Nov. 14, 1980, Ser. No. 206,835
Claims priority, application Denmark, May 22, 1980, 405/80
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—305



270,812
COMBINED DISPLAY CONTAINER AND PACKAGING INSERT
Enrique Bernat Fontlladosa, Paris St. 184, Barcelona, Spain
Filed May 13, 1981, Ser. No. 263,176
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—318

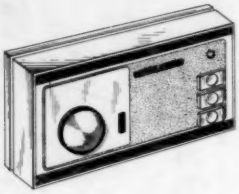


270,813
COMBINED PACKAGING CUP AND BASE THEREFOR
Vincent E. Fortuna, Huntington Beach, and Bertel R. Peterson, San Juan Capistrono, both of Calif., assignors to Vercon Inc., Coleman, Mich.
Filed May 15, 1981, Ser. No. 264,546
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—388

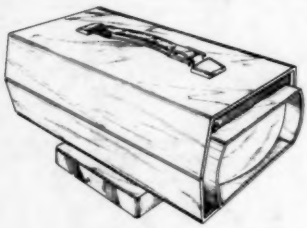


270,814
PACKAGING CUP OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Jun. 26, 1981, Ser. No. 278,301
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—388

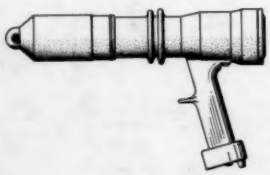
270,815
CLOCK THERMOSTAT
James A. Odom, Apple Valley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 6, 1981, Ser. No. 261,076
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



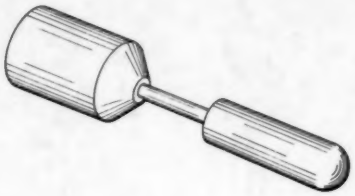
270,816
HOUSING FOR OPTICAL ELECTRONIC DISTANCE MEASURING INSTRUMENT
William A. Hays, Jr., 7788 S. Ogden Way, Littleton, Colo. 80122; Robert A. Gladden, 6719 S. Delaware St., Littleton, Colo. 80120, and John I. Shipp, 1422 Country Club La., Tullahoma, Tenn. 37388
Filed May 19, 1980, Ser. No. 151,206
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70



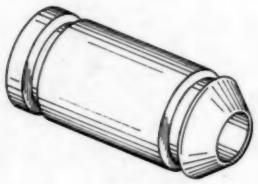
270,817
ELECTROSTATIC VOLTAGE MEASURING INSTRUMENT
James A. Kolibas, Broadview Heights, Ohio, assignor to Nordson Corporation, Amherst, Ohio
Filed Jul. 22, 1981, Ser. No. 285,739
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



270,818
VIBRATING VISCOMETER PROBE
Sanford L. Simons, 9188 S. Turkey Creek Rd., Morrison, Colo. 80465
Filed Mar. 16, 1981, Ser. No. 243,757
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—84



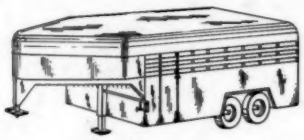
270,819
SAMPLE HOLDER FOR A VIBRATING VISCOMETER
Sanford L. Simons, 9188 S. Turkey Creek Rd., Morrison, Colo. 80465
Filed Mar. 16, 1981, Ser. No. 243,758
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—84



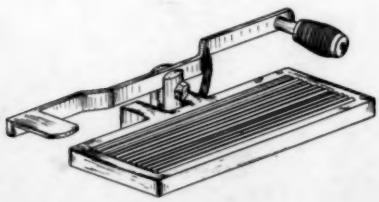
270,820
VISUAL MARKER
Herbert C. Schulze, P.O. Box 6070, Incline Village, Nev. 89450
Filed Feb. 23, 1981, Ser. No. 237,374
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109

270,821
JEWELRY CHAIN CLASP
Victor Fera, Sr., Lincoln, R.I., assignor to Sage Manufacturing Company, Inc., Providence, R.I.
Filed Oct. 13, 1981, Ser. No. 310,624
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—87

270,822
TRAILER
Clarence Triggs, Belmond, Iowa, assignor to Triggs Manufacturing Company, Belmond, Iowa
Filed Jun. 8, 1981, Ser. No. 271,196
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102

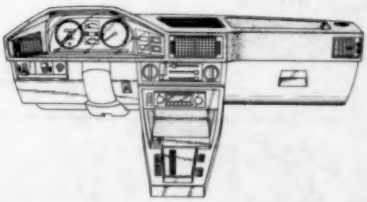


270,823
COMBINED FOOT REST AND TOE AND HEEL SHIFTER MECHANISM FOR A MOTORCYCLE
Andrew J. Mounts, Springfield, Ohio, assignor to Murray-Black Company, Springfield, Ohio
Filed Dec. 29, 1980, Ser. No. 220,307
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114

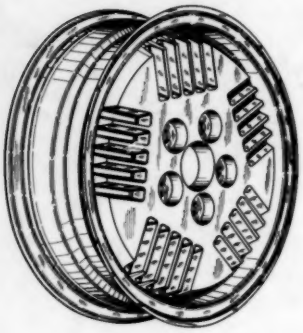


270,824
VEHICLE DISC BRAKE SHOE
Richard T. Robinette, St. Clair Shores, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Apr. 22, 1981, Ser. No. 256,449
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—180

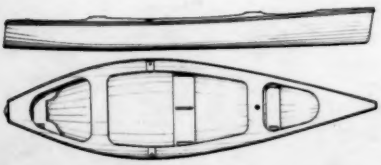
270,825
COMBINED VEHICLE DASHBOARD AND CONSOLE UNIT
Claus Luthe, Munich; Manfred Rennen, Ingolstadt, and Hans Braun, Lohhof, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Mar. 26, 1981, Ser. No. 247,908
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, MR 12 272
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—192



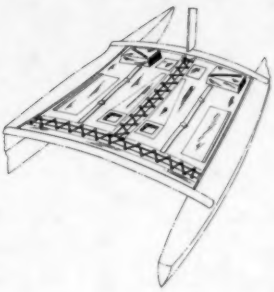
270,826
VEHICLE WHEEL
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Co., Romulus, Mich.
Filed Oct. 17, 1980, Ser. No. 197,851
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



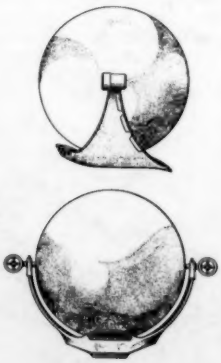
270,827
MULTI-PURPOSE BOAT
Jan W. Dorfman, Box 313, Sinnott Rd., Kennebunkport, Me. 04046
Filed Mar. 18, 1981, Ser. No. 245,133
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—302



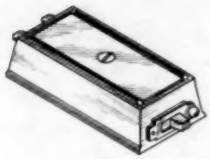
270,828
BOAT PLATFORM
Steven Alden, 2819 Las Vegas Trail, Fort Worth, Tex. 76116
Filed Aug. 11, 1980, Ser. No. 176,961
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—318



270,829
AIRSHIP
Frederick D. Ferguson, 217 Compton Ave., Ottawa, Ontario, Canada
Filed Jan. 26, 1981, Ser. No. 228,051
Claims priority, application Canada, Jan. 6, 1981, 06-01-81-4
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—323

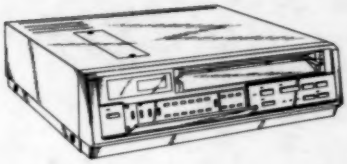


270,830
THEFT-PREVENTION IGNITION-DISABLING UNIT FOR VEHICLES
Stewart N. Jacobs, 19, Brookfield, Kimmage Rd. West, Dublin 12, Ireland
Filed Feb. 11, 1981, Ser. No. 233,545
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

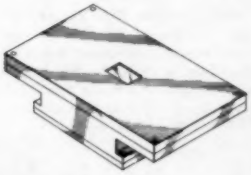


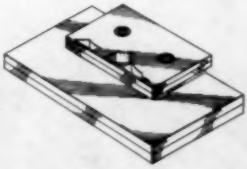
270,831
MULTIPLE SERVICE UNIT
Henning Jensen, Surfers Paradise, Australia, assignor to Common Sense Products Pty. Ltd., Surfers Paradise, Australia
Filed Nov. 7, 1980, Ser. No. 204,999
Claims priority, application Australia, Feb. 15, 1980, 80252; Feb. 15, 1980, 80253; Feb. 15, 1980, 80254; Feb. 19, 1980, PE2443
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—40

270,832
VIDEO DISC PLAYER
Minoru Hashimoto, Ibaraki; Yoshiyuki Nomura, Hirakata, and Masayoshi Kubo, Neyagawa, all of Japan, assignors to Matsushita Electric Industries Co., Ltd., Osaka, Japan
Filed Jan. 15, 1981, Ser. No. 273,809
Claims priority, application Japan, Dec. 25, 1980, 55-55150
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1

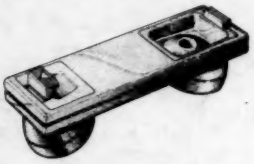


270,833
EXTENDED PLAY CASSETTE
Barry K. Spicer, Riverside, Calif., assignor to Technicolor, Inc., Los Angeles, Calif.
Filed May 27, 1981, Ser. No. 267,479
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11

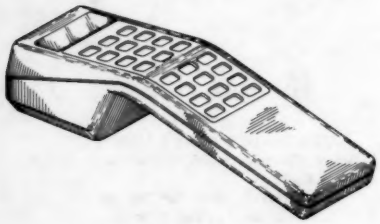




270,834
ACOUSTIC COUPLER ADAPTER
Donald M. Genaro, Haworth, N.J.; Gordon E. Sylvester, Jamaica, N.Y., and G. Varadarajan, East Windsor, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 5, 1981, Ser. No. 308,508
Term of patent 14 years
Int. Cl. D14—*103*
U.S. Cl. D14—57



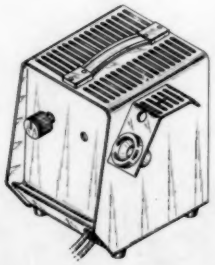
270,835
HOUSING FOR A VEHICULAR TELEPHONE CONTROL UNIT OR SIMILAR ARTICLE
Terrance N. Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 1, 1981, Ser. No. 269,294
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—64



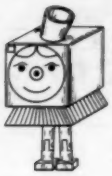
270,836
TELEPHONE INSTRUMENT
Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Dec. 4, 1980, Ser. No. 213,066
Claims priority, application Sweden, Jun. 11, 1980, 80001186
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

270,837
HAND-CUTTER
Bengt E. Legerius, Nyköping, and Hans W. Siebert, Oxelösund, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Oct. 17, 1980, Ser. No. 198,197
Claims priority, application Sweden, May 5, 1980, 80000909
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—139

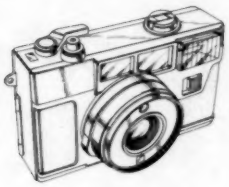
270,838
HOUSING FOR DESOLDERING SYSTEM MECHANISM
Daniel Koturov, Stanton, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Feb. 25, 1981, Ser. No. 237,930
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—144



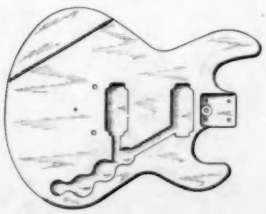
270,839
CAMERA
T. Jane Greif, 445 W. Davis Blvd., Tampa, Fla. 33606
Filed Jun. 12, 1981, Ser. No. 273,192
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



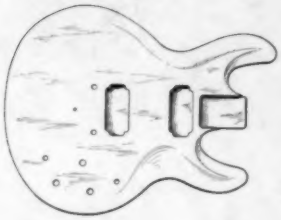
270,840
CAMERA
Koichi Soda, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Jul. 31, 1981, Ser. No. 288,696
Claims priority, application Japan, Feb. 2, 1981, 56-3621
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—6



270,841
GUITAR BODY
Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.
Filed May 22, 1981, Ser. No. 266,292
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



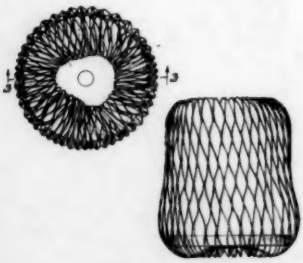
270,842
GUITAR BODY
Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.
Filed May 22, 1981, Ser. No. 266,293
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



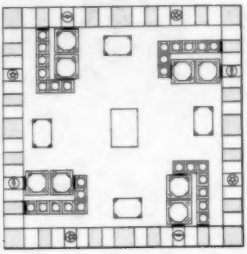
270,843
LIQUID INK BALL PEN
Kunio Itoh, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 16, 1981, Ser. No. 312,306
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

270,844
CIRCULAR SLIDE CHART
Janette K. McIntyre, 26331 Via Lara, Mission Viejo, Calif. 92692
Filed Dec. 1, 1980, Ser. No. 211,831
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64

270,845
PENCIL HOLDER
Robert S. Hansen, P.O. Box 1040, Doylestown, Pa. 19801
Continuation-in-part of Ser. No. 813,127, Jul. 5, 1977, abandoned. This application May 19, 1980, Ser. No. 151,477
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—85



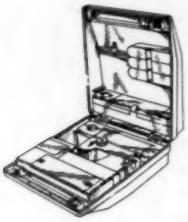
270,846
GAME BOARD
William J. McSweeney, 806 - 266 Bronson Ave., Ottawa, Ontario, K1R 6H8, Canada
Filed Nov. 23, 1981, Ser. No. 323,872
Claims priority, application Canada, Jun. 12, 1981, 12-06-81-2
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34



270,847
WHEELED TRUNDLE TOY
Robert Wood, 6010 Cable Ave., Camp Springs, Md.
Filed Apr. 3, 1981, Ser. No. 250,672
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—71

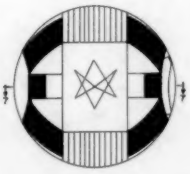
270,848
RIDING TOY
Eugene J. Echterling, 22740 Macfarlane Dr., Woodland Hills, Calif. 91364
Filed May 26, 1981, Ser. No. 267,265
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—74

270,849
COMBINED TOY SEWING MACHINE AND CASE THEREFOR
Peter W. Balderston, 17 Lulworth Ct., Kimberley, Nottinghamshire, England
Filed May 21, 1981, Ser. No. 266,050
Claims priority, application United Kingdom, Dec. 4, 1980, 997882
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—122



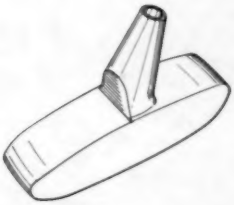
270,850
PINATA SHELL
Armando Ortega, 15316 Gard St., Norwalk, Calif. 90650
Filed Sep. 18, 1981, Ser. No. 303,530
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—165

270,851
GAME BALL
James W. Feger, Fuji House Apt. 11-(101) 3-2-4 Ebisu-Minami, Shibuya-Ku-Tokyo 150, Japan
Filed Feb. 6, 1981, Ser. No. 232,207
Claims priority, application Japan, May 19, 1980, 55-019305
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—204



270,852
GOLF PUTTER HEAD
Steven J. Mahaffey, Monson, and Allan W. Bender, Longmeadow, both of Mass., assignors to Questor Corporation, Tampa, Fla.
Filed Oct. 26, 1981, Ser. No. 314,716
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—217

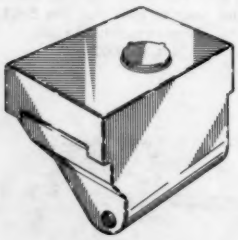
270,853
GOLF CLUB HEAD
Rolf S. Olsson, P.O. Box 120, 237 00 Bjarred, Sweden
Filed Dec. 16, 1981, Ser. No. 331,450
Claims priority, application Sweden, Jun. 22, 1981, 81-1420
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—218



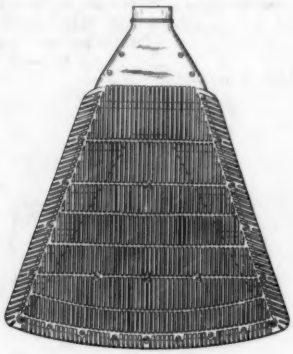
270,854
FISHING LURE
John R. Neese, P.O. Box 6001, Marietta, Ga. 30065
Filed Aug. 25, 1981, Ser. No. 296,131
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

270,855
DEVICE FOR BAITING FISH HOOKS
Joe Vit, Ogden, Utah, assignor to V&H Enterprises, Ogden, Utah
Filed Sep. 17, 1981, Ser. No. 303,166
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31

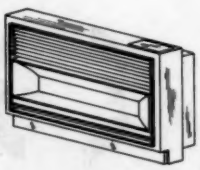
270,856
HOLDING TANK FOR A BOAT OR THE LIKE
Robert Peets, Island Heights; Burton L. Preston, Mansfield, and James A. Sigler, Perrysville, all of Ohio, assignors to Mansfield Sanitary Inc., Perrysville, Ohio
Filed Feb. 23, 1981, Ser. No. 237,478
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—2



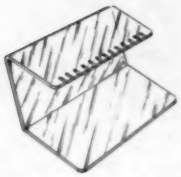
270,857
SECTOR ELEMENT FOR DISK FILTER
Holger Juutilainen, Tampere, Finland, assignor to Tamfelt OY AB, Tampere, Finland
Filed Mar. 7, 1980, Ser. No. 128,364
Claims priority, application Finland, Sep. 10, 1979, 572/79
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



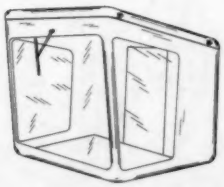
270,858
HEATER
Malcolm B. McInnes, Victoria, Australia, assignor to Pyrox Limited, Moorabbin, Australia
Filed May 11, 1981, Ser. No. 262,328
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



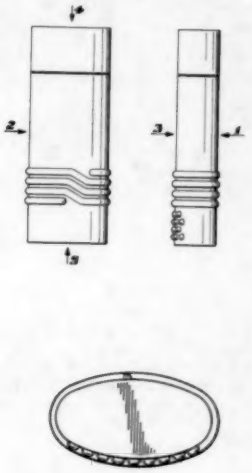
270,859
PHARMACEUTICAL RACK
Richard D. Levy, 10793 Riesling Dr., San Diego, Calif. 92131
Filed Mar. 9, 1981, Ser. No. 242,090
Term of patent 14 years
Int. Cl. D24—*99*; D6—*06*
U.S. Cl. D24—31



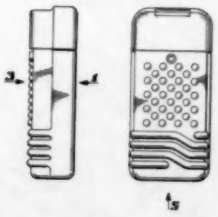
270,860
CONTROL BOOTH
M. Wayne Turner, Foley, Ala., assignor to Walker Industrial Plastics, Inc., Foley, Ala.
Filed Dec. 29, 1980, Ser. No. 221,038
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—16



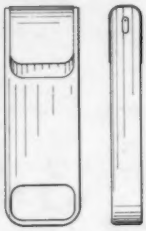
270,861
DISPENSER FOR LIQUID SOAP OR GELATINOUS MATERIAL
Yves Joyaux, Poitiers, and Jean-Pierre Mandon, Chasseneuil-du-Poitou, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Sep. 8, 1981, Ser. No. 299,908
Claims priority, application Switzerland, Mar. 20, 1981, 111 701
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—77



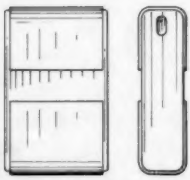
270,862
DISPENSER FOR LIQUID SOAP OR GELATINOUS MATERIAL
Yves Joyaux, Poitiers, and Jean-Pierre Mandon, Chasseneuil-du-Poitou, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Sep. 8, 1981, Ser. No. 299,909
Claims priority, application Switzerland, Mar. 19, 1981, 111 672
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—77



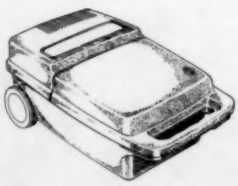
270,863
SPRAY
Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y Fornituras, S.A., Barcelona, Spain
Filed Jul. 22, 1981, Ser. No. 285,777
Claims priority, application Spain, Feb. 14, 1981, 98814
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—91.1



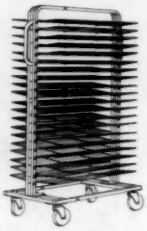
270,864
SPRAY
Carlos M. Martinez, Barcelona, Spain, assignor to Monturas Y Fornituras, S.A., Barcelona, Spain
Filed Jul. 22, 1981, Ser. No. 285,813
Claims priority, application Spain, Feb. 14, 1981, 98814
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—91.1



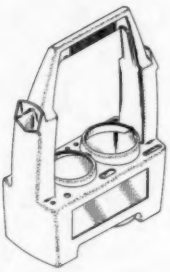
270,865
SUCTION CLEANER OR THE LIKE
David W. Moine, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Sep. 21, 1981, Ser. No. 304,268
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



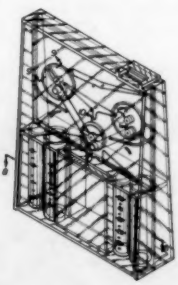
270,866
CART OR SIMILAR ARTICLE
Wayne K. Pfaff, 1316 Savannah, Irving, Tex. 75062
Filed Aug. 10, 1981, Ser. No. 291,363
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—22



270,867
CARRYING CASE FOR PLUMBING TOOLS AND EQUIPMENT
Richard J. Keohan, Braintree, Mass., assignor to Victor Equipment Company, San Francisco, Calif.
Filed Apr. 27, 1981, Ser. No. 257,761
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D34—44



270,868
COIN BANK
John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106, and John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143
Filed Apr. 29, 1982, Ser. No. 372,941
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—35



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF OCTOBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Sparks: *See*—
Stehouwer, William J., 4,407,082., Cl. 40-10.00C.

Aaronson, Alan M., to Stauffer Chemical Company. Flame retardant mixture for polyurethanes. 4,407,981., Cl. 521-107.000.

Aarts, Kornelis J., to Agence Spatiale Europeenne. Method of welding an aluminium object to a stainless steel object. 4,407,441., Cl. 228-176.000.

Abbott Laboratories: *See*—
Haviv, Fortuna; and Denet, Robert W., 4,407,803., Cl. 424-258.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Kaneda, Isami; Abe, Ryozo; Sakakibara, Susumu; and Sano, Yasushi, 4,408,312., Cl. 369-43.000.

Abel, Otto: *See*—
Wagener, Dietrich; Fach, Horst; Sauder, Peter; and Abel, Otto, 4,407,701., Cl. 202-99.000.

Abeles, Benjamin: *See*—
Moustakas, Theodore D.; Morel, Don L.; and Abeles, Benjamin, 4,407,710., Cl. 204-192.00S.

Abex Corporation: *See*—
Prox, Rolf, 4,408,159., Cl. 324-207.000.

Abo, Toshimi, to Nissan Motor Company, Limited. Plasma ignition system for an internal combustion engine. 4,407,259., Cl. 123-620.000.

Abraham, Nedumparambil A.: *See*—
Sestanj, Kazimir; Fung, Steven; Abraham, Nedumparambil A.; and Bellini, Francesco, 4,408,077., Cl. 568-441.000.

Abrahams, Louis; and Izod, Thomas P. J., to Millipore Corporation. Method for preparing a wear-resistant composition containing fluorinated graphite, graphite fibers and PTFE. 4,407,988., Cl. 523-334.000.

Accu-Feed Corp.: *See*—
Schroeder, James D., 4,407,433., Cl. 222-63.000.

ACF Industries, Incorporated: *See*—
Hammonds, James C.; and VanDyke, Ronald D., 4,407,617., Cl. 410-59.000.
Hausler, Frederick A., 4,407,514., Cl. 277-117.000.
Le, Tri C.; and Noble, Bruce P., 4,407,516., Cl. 277-206.00R.

Acker, Clarance R.: *See*—
Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarance R., 4,407,697., Cl. 162-137.000.

Acme General Corporation: *See*—
Bohannan, Jerry L., 4,407,476., Cl. 248-235.000.

Acrometal Products, Inc.: *See*—
Steinback, Clarence L., 4,407,096., Cl. 51-328.000.

Ad-Pro Industries, Inc.: *See*—
Ginder, William F., 4,407,662., Cl. 55-33.000.

Adam, Leslie E. S., to Varian Associates, Inc. Drive system. 4,407,659., Cl. 604-155.000.

Adamek, David J.: *See*—
McLaren, Edwin C.; and Adamek, David J., 4,407,426., Cl. 220-306.000.

Adamoli, Contardo; Bernardis, Francesco; Cretaz, Franco; and Gaiardo, Mario, to Ing. C. Olivetti & C., S.p.A. Ballistic wire matrix print head. 4,407,591., Cl. 400-124.000.

Adey, Anthony J.: *See*—
Brotherston, Colin P.; and Adey, Anthony J., 4,407,644., Cl. 417-462.000.

Adkins, Harold. Absorptive electromagnetic shielding for high speed computer applications. 4,408,255., Cl. 361-382.000.

Adlerteg, Bo; and Grees, Lennart, to ASEA Aktiebolag. Electric switch. 4,408,173., Cl. 335-16.000.

Advanced Micro Devices, Inc.: *See*—
Allen, Michael, 4,408,134., Cl. 307-471.000.

Agence Spatiale Europeenne: *See*—
Aarts, Kornelis J., 4,407,441., Cl. 228-176.000.

Agency of Industrial Science & Technology: *See*—
Koda, Yoshio, 4,407,655., Cl. 434-219.000.
Yamaguchi, Tomohiko, 4,407,975., Cl. 521-27.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Bauer, Walter, 4,408,340., Cl. 378-187.000.
Boie, Immo; and Wingender, Kaspar, 4,407,929., Cl. 430-220.000.
Bruck, Herbert; Steinbuchel, Gunter H.; Hofmann, Hans; Busch, Josef; and Hoffacker, Franz, 4,407,867., Cl. 427-365.000.
Thiele, Hartmut; Schmelter, Dieter; and Posch, Rainer, 4,407,412., Cl. 206-404.000.

Agnency of Industrial Science and Technology: *See*—
Furuya, Setsuko; Ohnishi, Shunji; and Kato, Masao, 4,408,012., Cl. 525-161.000.

Air Products and Chemicals, Inc.: *See*—
Eskinazi, Victoria; Kirner, John F.; and Wilson, Charles R., 4,407,738., Cl. 502-334.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Yuzo; Kimura, Toshihide; and Takada, Shigetaka, 4,407,248., Cl. 123-439.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Akagi, Motonobu; Tanahashi, Toshio; and Kato, Kichiro, 4,407,244., Cl. 123-339.000.
Ishii, Masami; Kato, Nobuharu; and Hota, Mikio, 4,407,691., Cl. 156-304.200.
Nishida, Koji; and Kawai, Taneichi, 4,408,242., Cl. 360-131.000.
Yamanaka, Minoru; Suzuki, Mitsuyuki; Haneda, Hideo; Kato, Masatoshi; and Ohtsuki, Masataka, 4,407,448., Cl. 236-88.000.

Ajinomoto Company Incorporated: *See*—
Tsuchida, Takayasu; and Sano, Kononuke, 4,407,952., Cl. 435-108.000.

Akagi, Motonobu; Tanahashi, Toshio; and Kato, Kichiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling the proportion of air and fuel in the air-fuel mixture of the internal combustion engine. 4,407,244., Cl. 123-339.000.

Akagi, Motoo; Uchino, Shoichi; and Nonogaki, Saburo, to Hitachi, Ltd. Process for forming fluorescent screen. 4,407,916., Cl. 430-23.000.

Akasaka, Shigeo: *See*—
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Ohtsubo, Yoshiaki; and Akasaka, Shigeo, 4,407,573., Cl. 354-33.000.

Akasaki, Isamu: *See*—
Kobayashi, Hiroyuki; Ohki, Yoshimasa; Toyoda, Yukio; and Akasaki, Isamu, 4,408,217., Cl. 357-17.000.

Akashi, Goro: *See*—
Okita, Tsutomu; Naruo, Kyoichi; and Akashi, Goro, 4,407,853., Cl. 427-44.000.

Akerstrom, Bengt, to Siemens Aktiengesellschaft. Endocardial electrode arrangement. 4,407,303., Cl. 128-785.000.

Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M. Composition for temporary substitution of bone tissue defects. 4,407,793., Cl. 424-81.000.

Akimune, Yoshio: *See*—
Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,407,057., Cl. 29-570.000.

Akino, Tadaharu; Nakamura, Akira; and Uemura, Hiroyuki, to TDK Electronics Co., Ltd. Noise filter with socket attached thereto. 4,408,171., Cl. 333-177.000.

Akkerman, Neil H., to AVA International; and Ava International. Subsurface well apparatus. 4,407,363., Cl. 166-183.000.

Aktiebolaget Bahco Verktyg: *See*—
Jansson, Erik C., 4,407,413., Cl. 206-493.000.

Aktiebolaget Samefa: *See*—
Nilsson, Lars-Erik; and Lofling, Tommy, 4,407,073., Cl. 33-203.180.

Akzo N.V.: *See*—
Groen, Marinus B., 4,407,753., Cl. 260-239.55R.

Alcon Laboratories, Inc.: *See*—
Schoenwald, Ronald D.; and Roehrs, Robert E., 4,407,792., Cl. 424-81.000.
Stark, Raymond L., 4,407,791., Cl. 424-80.000.

Alexander, William J., III. Weavers platform assembly and cloth guide. 4,407,332., Cl. 139-304.000.

Alheid, Robert J., to Beloit Corporation. Apparatus for high speed size application. 4,407,224., Cl. 118-405.000.

Alleman, Raymond A.: *See*—
Raush, Russell G.; and Alleman, Raymond A., 4,407,531., Cl. 285-158.000.

Allen, Hanceford L.; Berry, William W.; and Leibfried, Robert W., to International Minerals & Chemical Corp. Regeneration of activated carbon. 4,407,725., Cl. 502-25.000.

Allen, Jack H. Rain gutter construction. 4,407,097., Cl. 52-11.000.

Allen, Michael, to Advanced Micro Devices, Inc. Unitary exclusive or-and logic circuit. 4,408,134., Cl. 307-471.000.

Allen, Richard C.: *See*—
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,408,053., Cl. 546-226.000.
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,408,054., Cl. 546-226.000.

Allied Corporation: *See*—
Paquin, Patrick J., 4,407,693., Cl. 156-436.000.
Ulmer, Harry E.; Pickens, Donald; Rahl, Forrest J.; and Lefrancois, Philip A., 4,407,783., Cl. 423-347.000.

Allori, Aldo; Wilger, John A.; and Voss, Julian D., to International Harvester Co. Dynamic brake mount assembly. 4,407,394., Cl. 188-71.400.

Allsop, Inc.: *See*—
Biasini, Americole R., 4,407,182., Cl. 84-453.000.

Alps Electric Co., Ltd.: *See*—
Tanaka, Toshio, 4,408,105., Cl. 200-68.000.

Altex Scientific, Inc.: *See*—
Moeller, Roy P., 4,408,166., Cl. 329-106.000.

Altmann, Konrad: *See—*
Born, Gunthard; and Altmann, Konrad, 4,407,452., Cl. 239-132.500.
Alusuisse France S.A.: *See—*
Berger, Raymond; de Cachard, Maurice B.; Collet, Alain; Costes, Didier; Gouzy, Andre; Dupuy, Guy; Caunes, Pierre; and Chevrier, Claude, 4,407,359., Cl. 165-167.000.
Amazonen Werke H. Dreyer: *See—*
Dreyer, Heinz, 4,407,207., Cl. 111-85.000.
Ambe, Satoshi: *See—*
Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,407,057., Cl. 29-570.000.
AMCO Corporation: *See—*
Bentson, Wade, 4,407,189., Cl. 99-421.0HH.
American Brands, Inc.: *See—*
Hibbitts, Charles H., 4,407,306., Cl. 131-296.000.
American Can Company: *See—*
Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,407,873., Cl. 428-35.000.
Farrell, Christopher J.; Tsai, Boh C.; and Wachtel, James A., 4,407,897., Cl. 428-516.000.
Gehrke, Russell P., 4,407,874., Cl. 428-35.000.
American Cyanamid Company: *See—*
Kiernan, Jane A.; and Baker, Pamela K., 4,407,819., Cl. 424-304.000.
Labeda, David P.; Martin, John H. E. J.; and Goodman, Joseph J., 4,407,946., Cl. 435-75.000.
Miner, Thomas G.; and Bernstein, Seymour, 4,407,796., Cl. 424-180.000.
Nicolau, Gabriela; and Tonelli, Alfred P., 4,407,795., Cl. 424-180.000.
Raghu, Sivaraman, 4,408,072., Cl. 564-185.000.
Siddens, Jack K., 4,407,760., Cl. 260-465.00F.
Tseng, Shin-Shyong, 4,407,743., Cl. 252-700.000.
American Hoechst Corporation: *See—*
Ong, Helen H.; and Profitt, James A., 4,408,050., Cl. 546-17.000.
American Hospital Supply Corporation: *See—*
Lieber, Clement E.; Cooper, Robert P.; and Estes, Michael S., 4,407,304., Cl. 128-786.000.
American Medical Systems, Inc.: *See—*
Burton, John H.; Staehle, Bradford G.; and Kuyava, Charles C., 4,407,278., Cl. 128-79.000.
American Newspaper Publishers Association: *See—*
Matalia, Harshad D.; and Navi, Menashe, 4,407,196., Cl. 101-142.000.
American Standard Inc.: *See—*
Gilcher, Heinz, 4,407,470., Cl. 246-34.00R.
American Sterilizer Company: *See—*
Tratnyek, Joseph P., 4,407,960., Cl. 436-1.000.
Ames, Earl J. Door and lock support. 4,407,537., Cl. 292-337.000.
AMF Incorporated: *See—*
Jung, Wilhelm H.; and Diacont, George P., Jr., 4,407,210., Cl. 112-167.000.
Ammonia Casale S.A.: *See—*
Passariello, Attilio, 4,407,737., Cl. 502-243.000.
AMP Incorporated: *See—*
Bowen, Terry P.; Lawrence, George J.; and Wiley, Lawrence G., 4,408,353., Cl. 455-608.000.
Grabbe, Dimitry G., 4,408,218., Cl. 357-70.000.
Lockard, Joseph L., 4,407,555., Cl. 339-75.00M.
An, Seiji, to Kabushiki Kaisha Towa Giken; and An, Seiji, part interest to each. Field effect semiconductor laser, method of modulation thereof. 4,408,330., Cl. 372-45.000.
Anderson, Dale L., to Protronix, Inc. Mounting frame system for circuit boards. 4,407,416., Cl. 211-41.000.
Anderson, Glenn W.: *See—*
Hutchison, Stanley O.; and Anderson, Glenn W., 4,407,369., Cl. 166-291.000.
Anderson, Kenneth M., to Medtronic, Inc. Integral hermetic impantable pressure transducer. 4,407,296., Cl. 128-675.000.
Anderson, Robert C., Jr. Tack hook assembly for sail boats. 4,407,212., Cl. 114-108.000.
Anderson, Thomas E.; Bush, Alvin A.; and Giorgis, John, Jr., to General Electric Company. Stored charge inverter circuit with rapid switching. 4,408,270., Cl. 363-132.000.
Andersson, Nils E.; Eriksson, Sten; and Sinner, Bengt, to ASEA Aktiebolag. Apparatus for regulating fiber concentration. 4,407,698., Cl. 162-258.000.
Ando, Hiromi; and Tateoka, Kiyoshi, to Tokico Ltd. Pneumatic servo booster. 4,407,184., Cl. 91-376.00R.
Andrews, Martyn P.: *See—*
Wheatley, Nigel J.; and Andrews, Martyn P., 4,408,274., Cl. 364-200.000.
Andrione, Norbert; and Peruzzi, Federigo, to Aspera S.p.A. Crank mechanism for small, single-cylinder, reciprocating engines, particularly refrigerator compressors. 4,407,168., Cl. 74-579.00E.
Android Corporation: *See—*
Rise, William E.; and Masserang, Gregory J., 4,407,404., Cl. 198-774.000.
Rise, William E., 4,407,405., Cl. 198-774.000.
Anthony, Colin: *See—*
Spretnjak, Steve A.; and Anthony, Colin, 4,407,093., Cl. 49-391.000.
Anthony, Donald R., to Atlantic Richfield Company. High pressure insulating flange. 4,407,528., Cl. 285-50.000.
Aoyama, Kensuke: *See—*
Shima, Mutsuo; Aoyama, Kensuke; and Naka, Michiro, 4,407,881., Cl. 428-156.000.
Aplenc, Andrej M. R., to Sperry Corporation. Thermosyphon boiler for a geothermal pumping system. 4,407,126., Cl. 60-641.400.
Appleby, Anthony J.; and Crepy, Gilles, to Compagnie Generale d'Electricite. Cathode for an electrolyser. 4,407,908., Cl. 429-45.000.
Applied Engineering Co., Inc.: *See—*
Merrit, John H., Jr., 4,407,237., Cl. 122-390.000.
Arichi, Isao; Waniisi, Tetuya; and Koh, Takuji, to Omron Tateisi Electronics Co. Electronic oscillation counting timer. 4,407,588., Cl. 368-118.000.
Ariga, Shoji; and Tomita, Tadashi, to Clarion Co., Ltd. Acoustic apparatus. 4,408,095., Cl. 381-24.000.
Arimitsu Industry Co., Ltd.: *See—*
Namekata, Yoriaki, 4,407,640., Cl. 417-296.000.
Armco Inc.: *See—*
Brezny, Bohus, 4,407,972., Cl. 501-99.000.
Arnaud, Jean-Claude; and Devissaguet, Michelle, to Science Union Et Cie. Anti-ischemic pharmaceutic compositions. 4,407,801., Cl. 424-250.000.
Arnold, Herbert: *See—*
Horbelt, Michael; Arnold, Herbert; and Winkelmann, Lothar, 4,407,156., Cl. 73-118.000.
Arnold, Robert W.; and Skinner, Dean W., to International Business Machines Corporation. Constant energy drive circuit for electromagnetic print hammers. 4,408,129., Cl. 307-270.000.
Arrowhead Continental: *See—*
Giebeler, James F., 4,407,533., Cl. 285-281.000.
Artemenko, Vladimir I.; Belikov, Viktor T.; Ivlev, Anatoly D.; and Mamzelev, Viktor A., to Odessky Politekhnichesky Institut. Linear electric motor. 4,408,145., Cl. 318-135.000.
Asada, Tatuo: *See—*
Nakamura, Tstomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, 4,407,353., Cl. 165-39.000.
ASEA Aktiebolag: *See—*
Adlerteg, Bo; and Grees, Lennart, 4,408,173., Cl. 335-16.000.
Andersson, Nils E.; Eriksson, Sten; and Sinner, Bengt, 4,407,698., Cl. 162-258.000.
Ash, Darrell L., to Texas Instruments Incorporated. High-frequency channel selector having fixed bandpass filters in the RF section. 4,408,347., Cl. 455-179.000.
Ashida, Kazutaka, to Victor Company of Japan, Limited. Tape recording reproducing apparatus having improved fast forward drive system. 4,407,463., Cl. 242-201.000.
Ashihara, Yoshihiro: *See—*
Kasahara, Yasushi; and Ashihara, Yoshihiro, 4,407,944., Cl. 435-18.000.
Ashland Oil, Inc.: *See—*
Myers, George D., deceased; Hettinger, William P., Jr.; and Kovach, Stephen M., 4,407,714., Cl. 208-120.000.
Asp, Ralph T. Latch for sliding glass door. 4,407,539., Cl. 292-338.000.
Aspera S.p.A.: *See—*
Andrione, Norbert; and Peruzzi, Federigo, 4,407,168., Cl. 74-579.00E.
Associated Research, Inc.: *See—*
Beaubien, William H., 4,408,157., Cl. 324-62.000.
Atlantic Richfield Company: *See—*
Anthony, Donald R., 4,407,528., Cl. 285-50.000.
DiGiulio, Adolph V., 4,407,979., Cl. 521-59.000.
Harris, James J.; and Hostetler, Donald E., 4,407,727., Cl. 502-115.000.
Le-Khac, Bi, 4,408,010., Cl. 525-73.000.
Milkovich, Ralph; and Warfel, David R., 4,408,006., Cl. 524-534.000.
Nice, Ralph A., 4,407,865., Cl. 427-217.000.
Atomic Energy of Canada Limited: *See—*
Birnboim, Hyman C., 4,407,942., Cl. 435-6.000.
Atsumi, Tomiaki: *See—*
Kunihiro, Motoo; Atsumi, Tomiaki; Kuse, Kazumasa; and Ishigaki, Masahiro, 4,407,491., Cl. 267-140.100.
Augusto, Peter; Hazard, Edwin A.; and Mohrman, Richard C., to Bausch & Lomb Incorporated. Compact refraction instrument. 4,407,571., Cl. 351-13.000.
Aulich, Hubert; and Auracher, Franz, to Siemens Aktiengesellschaft. Apparatus and process for producing a cladded optical fiber having a longitudinal side coupling zone. 4,407,668., Cl. 65-3.110.
Auracher, Franz: *See—*
Aulich, Hubert; and Auracher, Franz, 4,407,668., Cl. 65-3.110.
Austin, Lowell W.: *See—*
Smith, John R.; Bingle, William D.; and Austin, Lowell W., 4,407,149., Cl. 72-47.000.
Automatic Doorman, Inc.: *See—*
Beckerman, Howard L., 4,408,146., Cl. 318-264.000.
Automotive Products Limited: *See—*
Parsons, David, 4,407,125., Cl. 60-584.000.
Autosteer Developments Limited: *See—*
Auty, David, 4,407,384., Cl. 180-146.000.
Auty, David, to Autosteer Developments Limited. Power assisted steering arrangements and devices for use therein. 4,407,384., Cl. 180-146.000.
Ava International: *See—*
Akkerman, Neil H., 4,407,363., Cl. 166-183.000.
Akkerman, Neil H., 4,407,363., Cl. 166-183.000.

Avins, Jack. Automotive control systems for improving fuel consumption. 4,408,293., Cl. 364-426.000.

Ayerst, McKeena & Harrison, Inc.: *See*—
Sestanj, Kazimir; Fung, Steven; Abraham, Nedumparambil A.; and Bellini, Francesco, 4,408,077., Cl. 568-441.000.

B. F. Goodrich Company, The: *See*—
Barnhouse, James P., 4,408,013., Cl. 525-187.000.
Kolycheck, Edmond G., 4,408,020., Cl. 525-415.000.

Baba, Toshihiro: *See*—
Takatsuka, Keizo; Yamamoto, Hiroshi; and Baba, Toshihiro, 4,408,108., Cl. 200-148.00A.

Babcock & Wilcox Company, The: *See*—
Widener, Joseph; Britt, James M.; and LaPrade, Steve A., 4,407,969., Cl. 501-95.000.

Baboian, Robert; and Haynes, Gardner, to Texas Instruments Incorporated. Corrosion protection system for hot water tanks. 4,407,711., Cl. 204-196.000.

Backlund, Erik L., to Forenade Fabriksverken. Method for heat absorption from a sea bottom or the like. 4,407,351., Cl. 165-1.000.

Backlund, Jonathan C.; and Duval, Eugene F., to Fafco, Inc. Tiedown fastening device. 4,407,477., Cl. 248-499.000.

Bahnsen, Bahne P.; and Kanow, Willy, to U.S. Philips Corporation. AM-FM Radio receiver for receiving AM-stereo signals. 4,408,097., Cl. 381-15.000.

Bahring, Horst, to Privates Institut fur Physikalisch Technische Auftragsforschung GmbH. Apparatus for elimination play in gear wheel transmissions. 4,407,544., Cl. 297-362.000.

Bailey, James W.: *See*—
Bement, Laurence J.; and Bailey, James W., 4,407,468., Cl. 244-137.00P.

Bailey, William F.: *See*—
Garscadden, Alan; Bailey, William F.; and Duke, Gary L., 4,407,705., Cl. 204-157.10H.

Baker, Pamela K.: *See*—
Kiernan, Jane A.; and Baker, Pamela K., 4,407,819., Cl. 424-304.000.

Baker, Richard R.; and Dashley, Federick J., to British-American Tobacco Company Limited. Smoking articles. 4,407,308., Cl. 131-336.000.

Balcke-Durr Aktiengesellschaft: *See*—
Denner, Peter; Ernst, Egon; and Jockel, Alfred, 4,407,064., Cl. 29-726.000.

Baldwin, John J.; and Lumma, William C., Jr., to Merck & Co., Inc. Imidazodiazines. 4,408,047., Cl. 544-250.000.

Baldwin, John J.; and McClure, David E., to Merck & Co., Inc. Preparation of epihalohydrin enantiomers. 4,408,063., Cl. 549-518.000.

Ball, Alease E. Cover for caskets. 4,407,053., Cl. 27-14.000.

Ball, Peter R.: *See*—
Culshaw, Brian; Ball, Peter R.; Kingsley, Stuart A.; and Davies, David E. N., 4,408,354., Cl. 455-610.000.

Ball, William J.; Palmer, Keith W.; and Stewart, David G., to British Petroleum Company Limited, The. Method for producing crystalline aluminosilicates and their use as catalysts and catalyst supports. 4,407,728., Cl. 502-60.000.

Ballinger, Nicholas K.: *See*—
Gladman, Terence; and Ballinger, Nicholas K., 4,407,680., Cl. 148-12.00F.

Bandel, Paolo; and Caretta, Renato, to Industrie Pirelli S.p.A. Pneumatic tire for motor vehicles having a low power absorption and a high directional control stability. 4,407,346., Cl. 152-209.00R.

Bankert, Ralph A.; and Dumas, David H., to Hercules Incorporated. Aqueous sizing composition comprising ketene dimer and epihalohydrin/polyamino polyamide/bis(hexamethylene)triamine reaction product. 4,407,994., Cl. 524-107.000.

Barnabeo, Austin E., to Union Carbide Corporation. Polysiloxanes and the use thereof in the production of silane modified alkylene-alkyl acrylate copolymers. 4,408,011., Cl. 525-100.000.

Barner, Richard; and Hubscher, Josef, to Hoffmann-La Roche Inc. Cholecalciferol derivatives. 4,407,754., Cl. 260-239.55D.

Barnert, Eike, to Kernforschungsanlage Julich GmbH. Gas-feed nozzle for a pyrolytic particle coating apparatus. 4,407,230., Cl. 118-716.000.

Barnhouse, James P., to B. F. Goodrich Company, The. Epihalohydrin polymer cure systems. 4,408,013., Cl. 525-187.000.

Barthell, Eduard: *See*—
Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, 4,408,073., Cl. 564-204.000.

Bartman, Benjamin; and Swift, Graham, to Rohm and Haas Company. Acetoacetate functionalized polymers and monomers useful for crosslinking formulations. 4,408,018., Cl. 525-300.000.

Bartok, William; and Freund, Howard, to Exxon Research and Engineering Co. Partial combustion process for coal. 4,407,206., Cl. 110-347.000.

Barton, John R.: *See*—
King, James D.; Burkhardt, Gary L.; Barton, John R.; and Matzkanin, George A., 4,408,160., Cl. 324-209.000.

BASF Aktiengesellschaft: *See*—
Eilingsfeld, Heinz; Neumann, Peter; Seybold, Guenther; Lenke, Dieter; and Friedrich, Ludwig, 4,407,810., Cl. 424-270.000.
Hoffman, Dietrich; and Schopke, Holger, 4,407,886., Cl. 428-320.800.
Merger, Franz; and Foerster, Hans-Juergen, 4,408,079., Cl. 568-463.000.
Naarmann, Herbert; Penzien, Klaus; and Schlag, Johannes, 4,407,739., Cl. 252-512.000.

BASF Wyandotte Corporation: *See*—
Langdon, William K., 4,408,084., Cl. 568-601.000.

Bates, Farrell C. Curved ball court. 4,407,501., Cl. 273-118.00R.

Battelle Development Corporation: *See*—
Wilkinson, William H., 4,407,131., Cl. 60-648.000.
Zega, Bogdan, 4,407,713., Cl. 204-298.000.

Battocletti, Frank E.: *See*—
Kovalchik, Donald P.; and Battocletti, Frank E., 4,408,283., Cl. 364-483.000.

Bauer, Karl-Heinz, to Preh Elektrofeinmechanische Werke Jakob Preh. Key assembly. 4,408,346., Cl. 455-175.000.

Bauer, Manfred, to Robert Bosch GmbH. Fuel injection pump for self-igniting internal combustion engines. 4,407,253., Cl. 123-506.000.

Bauer, Peter; and Lazrus, Julian, to Bowles Fluidics Corporation. Washing method using a fluidic oscillator. 4,407,032., Cl. 8-158.000.

Bauer, Peter. Bistable latch. 4,407,538., Cl. 292-87.000.

Bauer, Walter, to AGFA-Gevaert Aktiengesellschaft. Means for holding X-ray films. 4,408,340., Cl. 378-187.000.

Baumgartner, Herman J., to Shell Oil Company. Oxidation of isobutane in the dense phase and at low oxygen concentration. 4,408,082., Cl. 568-571.000.

Bausch & Lomb Incorporated: *See*—
Augusto, Peter; Hazard, Edwin A.; and Mohrman, Richard C., 4,407,571., Cl. 351-13.000.

Bavaria B.V.: *See*—
van de Velde, Reindert, 4,407,160., Cl. 73-296.000.

Baxter Travenol Laboratories, Inc.: *See*—
Nevens, Charles; and Williams, Ronald A., 4,407,660., Cl. 604-6.000.

Bayer Aktiengesellschaft: *See*—
Birkenstock, Udo; and Schmidt, Herbert, 4,407,733., Cl. 502-174.000.
Blank, Heinz U.; Behre, Horst; Linden, Hans W.; and Mentzel, Werner, 4,407,762., Cl. 260-508.000.
Forster, Heinz; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,408,055., Cl. 548-125.000.
Hocker, Jurgen; Wieder, Wolfgang; and Dhein, Rolf, 4,408,027., Cl. 526-185.000.
Hohmann, Walter; and Stawitz, Josef, 4,408,056., Cl. 548-416.000.
Junge, Bodo; Stoltefuss, Jurgen; Muller, Lutz; Krause, Hans-Peter; and Sitt, Rudiger, 4,407,809., Cl. 424-267.000.
Perrey, Hermann; Matner, Martin; Schwimm, Ernst; and Rudolph, Hans, 4,407,724., Cl. 252-312.000.
Salzburg, Herbert; Meyborg, Holger; and Ziemann, Heinz, 4,408,061., Cl. 549-464.000.
Schmidt, Thomas; Timmler, Helmut; Bonse, Gerhard; Blank, Heinz U.; and Marzolph, Gerhard, 4,408,044., Cl. 544-182.000.

Baylor, John M., to J. I. Case Company. Replaceable wear cover for track bushing. 4,407,551., Cl. 305-57.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Ecklin, Gaston, 4,408,249., Cl. 361-127.000.

Beaubien, William H., to Associated Research, Inc. Resistance measuring arrangement. 4,408,157., Cl. 324-62.000.

Beaudet, Leo A.: *See*—
Fotland, Richard A.; and Beaudet, Leo A., 4,408,214., Cl. 346-159.000.

Beaufrere, Albert H. Regeneratively cooled coal combustor/gasifier with integral dry ash removal. 4,407,205., Cl. 110-264.000.

Bechthold, Howard D., to Otis Engineering Corporation. Flow control apparatus for wells. 4,407,362., Cl. 166-117.500.

Beck, Donald R. Hose handler-keeper. 4,407,472., Cl. 248-89.000.

Beck, Ernst; and Lenard, Peter, to Vollmer Werke Maschinenfabrik GmbH. Method for repairing hard alloy-tipped saw blades. 4,407,172., Cl. 76-112.000.

Beck, Martin H.; Krishnakumar, Suppayan M.; and Collette, Wayne N., to Continental Group, Inc., The. Hybrid reheating system and method for polymer preforms. 4,407,651., Cl. 432-11.000.

Beck, Rene A., to Gram S.A. Complex column. 4,407,106., Cl. 52-722.000.

Beckerman, Howard L., to Automatic Doorman, Inc. Automatic door operator. 4,408,146., Cl. 318-264.000.

Beckman Instruments, Inc.: *See*—
Bernot, Anthony J.; and Brown, Kenneth, 4,407,658., Cl. 445-25.000.

Becton Dickinson and Company: *See*—
Voge, Andrew; Sparks, Daniel R.; and Mullins, Barry W., 4,408,252., Cl. 361-288.000.

Bedini, Raffaele; Lauro, Luciano; and Pinotti, Pier C., to Olivetti Controllo Numerico S.p.A. Adaptive numerical control apparatus for machine tools. 4,408,280., Cl. 364-474.000.

Beecham Group Limited: *See*—
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Beeson, Don E.: *See*—
Butler, Gordon K.; and Beeson, Don E., 4,407,241., Cl. 123-90.160.

Behre, Horst: *See*—
Blank, Heinz U.; Behre, Horst; Linden, Hans W.; and Mentzel, Werner, 4,407,762., Cl. 260-508.000.

Belikov, Viktor T.: *See*—
Artemenko, Vladimir I.; Belikov, Viktor T.; Ivlev, Anatoly D.; and Mamzelev, Viktor A., 4,408,145., Cl. 318-135.000.

Bell, Alan E., to RCA Corporation. Reinforced bubble recording medium and information record. 4,408,213., Cl. 346-135.100.

Bell Telephone Laboratories, Incorporated: *See*—
Boll, Harry J., 4,408,130., Cl. 307-296.00R.
Bulley, Raymond M.; MacPherson, William F.; and Youhas, Robert F., 4,408,248., Cl. 361-91.000.

Fraser, David B.; and Watts, Roderick K., 4,407,933., Cl. 430-296.000.
Grodkiewicz, William H.; Singh, Shobha; and Van Uitert, LeGrand G., 4,407,061., Cl. 29-576.00B.
Haas, Laird K. S.; Herring, Larry H.; and Nakada, Yoshinao, 4,407,849., Cl. 427-37.000.
Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, 4,408,331., Cl. 372-46.000.
Montgomery, Warren A., 4,408,323., Cl. 370-60.000.
Walters, Stephen M., 4,408,272., Cl. 364-200.000.
Young, William C., 4,407,562., Cl. 350-96.200.
Zipfel, George G., Jr., 4,407,054., Cl. 29-25.350.

Bellini, Francesco: *See*—
Sestanj, Kazimir; Fung, Steven; Abraham, Nedumparambil A.; and Bellini, Francesco, 4,408,077., Cl. 568-441.000.

Bellman, Robert H.: *See*—
Kuchinsky, Saul; Bellman, Robert H.; and Ogle, James A., 4,407,934., Cl. 430-314.000.

Beloit Corporation: *See*—
Alheid, Robert J., 4,407,224., Cl. 118-405.000.

Bement, Laurence J.; and Bailey, James W., to United States of America, National Aeronautics and Space Administration. Explosively activated egress area. 4,407,468., Cl. 244-137.00P.

Bender, Richard; and Feuerstake, Eugen, to Diehl GmbH & Co. Detonator such as an electrical mechanical or flame-sensitive detonator. 4,407,200., Cl. 102-202.500.

Bendix Corporation, The: *See*—
Brown, Arthur K., 4,407,643., Cl. 417-401.000.
Caruso, Peter J., 4,408,188., Cl. 340-345.000.
Crumb, Donald A., 4,407,121., Cl. 60-562.000.
Taft, Darwin O.; and Van Siclen, Howard E., Jr., 4,407,257., Cl. 123-612.000.

Bennett, Emeric S.; and Sauerland, Franz L., to Transat Corp. Apparatus for automatic lapping control. 4,407,094., Cl. 51-165.00R.

Bennett, Everett W.; and Suchy, Jan B., to James River-Graphics, Inc. Electrophotographic elements with polyester binder resins having aprotic end groups. 4,407,921., Cl. 430-96.000.

Benstead, Alan J.: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,407,830., Cl. 426-272.000.

Benton, Robert L.; Martinsons, Dainis O.; and Stimpson, Flave F., to General Motors Corporation. Seal and scraper assembly. 4,407,511., Cl. 277-24.000.

Bentson, Wade, to AMCO Corporation. Roast spit. 4,407,189., Cl. 99-421.0HH.

Berardinelli, Frank M.: *See*—
Cincotta, David E.; and Berardinelli, Frank M., 4,408,022., Cl. 525-444.000.

Berger, Raymond; de Cachard, Maurice B.; Collet, Alain; Costes, Didier; Gouzy, Andre; Dupuy, Guy; Caunes, Pierre; and Chevrier, Claude, to Commissariat a l'Energie Atomique; and Alusuisse France S.A. Plate heat exchanger. 4,407,359., Cl. 165-167.000.

Bergwerksverband GmbH: *See*—
Bonn, Berhard; Giertz, Franz; Holl, Lothar; and Schreckenberg, Heinz, 4,407,355., Cl. 165-104.160.
Wallussek, Heinz; Wiebe, Martin; and Roder, Thomas, 4,407,374., Cl. 175-24.000.

Berkley and Company, Inc.: *See*—
Foote, Danny R., 4,408,088., Cl. 136-226.000.

Bernard Matthews Limited: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,407,830., Cl. 426-272.000.

Bernardis, Francesco: *See*—
Adamoli, Contardo; Bernardis, Francesco; Cretaz, Franco; and Gaiardo, Mario, 4,407,591., Cl. 400-124.000.

Bernauer, Karl; Link, Helmut; and Stohler, Harro, to Hoffmann-La Roche Inc. Imidazolidine derivatives. 4,407,814., Cl. 424-273.00R.

Bernot, Anthony J.; and Brown, Kenneth, to Beckman Instruments, Inc. Gas discharge display device sealing method for reducing gas contamination. 4,407,658., Cl. 445-25.000.

Bernstein, Seymour: *See*—
Miner, Thomas G.; and Bernstein, Seymour, 4,407,796., Cl. 424-180.000.

Berry, William W.: *See*—
Allen, Hanceford L.; Berry, William W.; and Leibfried, Robert W., 4,407,725., Cl. 502-25.000.

Bertolacini, Ralph J.: *See*—
Pellet, Regis J.; Gradassi, Michael J.; and Bertolacini, Ralph J., 4,407,736., Cl. 502-230.000.

Bertram, James L.; Ham, George E.; and Chen, Wuu-Nan, to Dow Chemical Company, The. Process for preparing low molecular weight epoxy resins. 4,408,062., Cl. 549-517.000.

Bertrand, Jacques C.: *See*—
Grushkin, Bernard; and Bertrand, Jacques C., 4,407,922., Cl. 430-98.000.

Betts, Malcolm C.; Graves, Alan F.; Pascoe, Frederick M.; and Dilley, James E., to Northern Telecom Limited. Method and apparatus for code conversion of binary to multilevel signals. 4,408,189., Cl. 340-347.0DD.

Betzner, William E.; Holtman, Richard K.; and Hill, Allen R., to Celotex Corporation, The. Blow line addition of isocyanate binder in fiberboard manufacture. 4,407,771., Cl. 264-115.000.

Biasini, Americole R., to Allsop, Inc. Musical instrument stand. 4,407,182., Cl. 84-453.000.

Biddle, Richard A.; Vriesen, Calvin W.; and Sutton, Ernest S., to Thiokol Corporation. Gas generator method for producing cool effluent gases with reduced hydrogen cyanide content. 4,407,119., Cl. 60-219.000.

Bingle, William D.: *See*—
Smith, John R.; Bingle, William D.; and Austin, Lowell W., 4,407,149., Cl. 72-47.000.

Bio-Systems Research, Inc.: *See*—
Lionelle, Joseph E.; and Staffa, Jeffrey A., 4,407,818., Cl. 424-289.000.

Biox Technology, Inc.: *See*—
Wilber, Scott A., 4,407,290., Cl. 128-633.000.

Birkenstock, Udo; and Schmidt, Herbert, to Bayer Aktiengesellschaft. Supported catalysts and process for their preparation. 4,407,733., Cl. 502-174.000.

Birnboim, Hyman C., to Atomic Energy of Canada Limited. Fluorescent detection of DNA damage. 4,407,942., Cl. 435-6.000.

Bischoff, Ludwig: *See*—
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; Bischoff, Ludwig; Penkert, Rosemarie; and Siefert, Eicke, 4,407,947., Cl. 435-85.000.

Bittner, Klaus-Jurgen: *See*—
Kostner, Armin; Lenhart, Richard; and Bittner, Klaus-Jurgen, 4,407,339., Cl. 141-10.000.

Black, David H. A.; and Pelletier, Georges H. Noise signal level control in a TASI system. 4,408,324., Cl. 370-81.000.

Blair Industries, Inc.: *See*—
Graetz, Herbert; and Unterreiner, Ronald C., 4,407,410., Cl. 206-387.000.

Blanc, Claude; Galy, Henry; and Elgue, Jean, to Societe Nationale Elf Aquitaine (Production). Process for the selective extraction treatment of gaseous hydrocarbon mixture containing carbon dioxide. 4,407,784., Cl. 423-228.000.

Blanc, Maurice: *See*—
Chiovini, Jacky; Margolis, Geoffrey; and Blanc, Maurice, 4,407,834., Cl. 426-422.000.

Blank, Heinz U.; Behre, Horst; Linden, Hans W.; and Mentzel, Werner, to Bayer Aktiengesellschaft. Process for the isolation of 1-naphthylamine-4,8-disulphonic acid. 4,407,762., Cl. 260-508.000.

Blank, Heinz U.: *See*—
Schmidt, Thomas; Timmler, Helmut; Bonse, Gerhard; Blank, Heinz U.; and Marzolph, Gerhard, 4,408,044., Cl. 544-182.000.

Bledsoe, Gary R., to Medical Designs, Inc. Brace for articulated limbs. 4,407,276., Cl. 128-80.00C.

Blum, Alfons: *See*—
Maurer, Robert; Blum, Alfons; and Hoffmann, Michael, 4,408,351., Cl. 455-260.000.

Blum, Alfred E. G., to Massey-Ferguson-Perkins Limited. Valve seats. 4,407,242., Cl. 123-188.00S.

Blum, Helmut; and Worms, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of ω-amino-1-hydroxyalkylidene-1,1-bisphosphonic acid. 4,407,761., Cl. 260-502.50C.

Blunt, Harry W., to Hercules Incorporated. Block copolymers of ethylene and propylene. 4,408,019., Cl. 525-323.000.

Boaz, Premakaran T., to Ford Motor Company. Process for the manufacture of glass sheets. 4,407,847., Cl. 427-35.000.

Bobovnikov, Nikolai G.: *See*—
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.

Bobrycki, Richard: *See*—
Morin, Robert W.; Lewis, Jeffrey M.; and Bobrycki, Richard, 4,407,223., Cl. 118-212.000.

Boeder, Dieter; and Wiemers, Karl-Josef, to Rheinmetall GmbH. Internal diameter measuring device for pipes. 4,407,071., Cl. 33-178.00E.

Boeing Company, The: *See*—
Fitch, John L.; and Spencer, Donald B., 4,408,206., Cl. 343-352.000.

Bogle, Charles T.: *See*—
Kijesky, Michael M.; and Bogle, Charles T., 4,408,284., Cl. 364-485.000.

Bohannan, Jerry L., to Acme General Corporation. Combined shelf and clothes bar assembly. 4,407,476., Cl. 248-235.000.

Bohme, Rolf C.; and Lazerson, Max M., to General Mining Union Corporation Limited. Method of grade determination including compensation. 4,407,415., Cl. 209-556.000.

Boie, Immo; and Wingender, Kaspar, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material for the production of colored images by the dye diffusion transfer process. 4,407,929., Cl. 430-220.000.

Boll, Harry J., to Bell Telephone Laboratories, Incorporated. Temperature stabilized voltage reference. 4,408,130., Cl. 307-296.00R.

Bolton, Philip; and Burdekin, Norman, to Neotechnic Engineering Limited. Valve assembly for a pressurized aerosol-dispensing container. 4,407,481., Cl. 251-353.000.

Bone, Rainer: *See*—
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; and Rubrecht, Jens-Detlef, 4,408,289., Cl. 364-551.000.

Boning, Bernward; Bone, Rainer; Nagel, Rudolf; and Rubrecht, Jens-Detlef, to Robert Bosch GmbH. Simplified monitoring apparatus for sensors in motor vehicles. 4,408,289., Cl. 364-551.000.

Bonn, Berhard; Giertz, Franz; Holl, Lothar; and Schreckenberg, Heinz, to Bergwerksverband GmbH. Method and apparatus for decreasing the heat and material exchange in the direct vicinity of the walls of fluidized bed reactors. 4,407,355., Cl. 165-104.160.

Bonne, Claude; Coquelet, Claude; and Sincholle, Daniel, to Laboratoires Chauvin-Blache. Etheral imidazoles and use in treatment of thromboses. 4,407,812., Cl. 424-273.00R.

Bonner, Clive E.; and Sanford, Herbert F., to Honeywell Inc. Tape cleaner. 4,408,243., Cl. 360-137.000.

Bonnet, Emile: *See*—
Rey, Pierre; and Bonnet, Emile, 4,407,414., Cl. 206-553.000.

Bonse, Gerhard: *See*—
Schmidt, Thomas; Timmler, Helmut; Bonse, Gerhard; Blank, Heinz U.; and Marzolph, Gerhard, 4,408,044., Cl. 544-182.000.

Boocock, John R. B.; and Murray, Ronald E., to Du Pont Canada Inc. Recovery of a proteinaceous oat fraction from a dispersion thereof in hydrocarbon solvent. 4,407,841., Cl. 426-656.000.

Boone, Jeffrey S.: *See*—
Cortellini, Conrad; Boone, Jeffrey S.; and Conard, Richard D., 4,408,277., Cl. 364-300.000.

Boothe, Leland H. Ladder hinge and multi-position locking mechanism therefor. 4,407,045., Cl. 16-327.000.

Boots, Robert T., to Vermeulen-Hollandia Octrooien B.V. Sliding roof. 4,407,541., Cl. 296-216.000.

Borg-Warner Corporation: *See*—
Haines, Roger W.; and Purinton, Mark A., 4,407,185., Cl. 98-1.500.

Born, Gunthard; and Altmann, Konrad, to Messerschmitt Boelkow Blohm Gesellschaft mit Beschraenkter Haftung. Apparatus for mixing gases in molecular lasers. 4,407,452., Cl. 239-132.500.

Boscher, Daniel: *See*—
Le Noane, Georges; and Boscher, Daniel, 4,407,667., Cl. 65-3.110.

Bosco, Peter M.; and Danielson, Robert L., to Nabisco Brands, Inc. Cold water soluble gelatin and process. 4,407,836., Cl. 426-576.000.

Boston Machine Works Company: *See*—
Morin, Robert W.; Lewis, Jeffrey M.; and Bobrycki, Richard, 4,407,223., Cl. 118-212.000.

Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, to Fonderie et Ateliers des Sablons. Vessel lid especially for a mixer used for the homogenization of a mixture of products. 4,407,584., Cl. 366-279.000.

Bour, Edmond H. J. P.: *See*—
Gaymans, Reinoud J.; and Bour, Edmond H. J. P., 4,408,036., Cl. 528-335.000.

Bowen, B. Dean: *See*—
Mills, Gary L.; and Bowen, B. Dean, 4,407,486., Cl. 266-87.000.

Bowen, Terry P.; Lawrence, George J.; and Wiley, Lawrence G., to AMP Incorporated. Coaxial cable/fiber optic bus network. 4,408,353., Cl. 455-608.000.

Bowles Fluidics Corporation: *See*—
Bauer, Peter; and Lazrus, Julian, 4,407,032., Cl. 8-158.000.

Boyack, John D. Concrete and resin swimming pool wall. 4,407,102., Cl. 52-169.700.

Boyama, Kimihiro, to Kokusan Denki Co., Ltd. Ignition signal generating device for use in contactless ignition system. 4,407,246., Cl. 123-415.000.

Boyle, Daniel J., to Champion International Corporation. Product counter display. 4,407,417., Cl. 211-69.100.

Bozzacco, Eleanor. Safety collar for pets. 4,407,233., Cl. 119-106.000.

Brachet, Claude: *See*—
Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,407,584., Cl. 366-279.000.

Brachman, Dina I.: *See*—
Eigen, Edward; Brachman, Dina I.; and Friedman, Stuart D., 4,407,789., Cl. 424-69.000.

Bradley, David J., to International Business Machines Corporation. Apparatus and method for reading and writing text characters in a graphics display. 4,408,200., Cl. 340-747.000.

Bradley, Jack, to Cushman Electronics, Inc. Method and apparatus for television distribution system sweep testing. 4,408,227., Cl. 358-139.000.

Brain, Sally A.: *See*—
Robinson, Joseph G.; and Brain, Sally A., 4,408,003., Cl. 524-364.000.

Brammer, John W. Adjustable tie rack. 4,407,418., Cl. 211-87.000.

Branch, Clive L.: *See*—
Pearson, Michael J.; and Branch, Clive L., 4,407,815., Cl. 424-274.000.

Brandt, Ludwig; and Pokar, Hellmut. Intratracheal tube. 4,407,281., Cl. 128-207.150.

Bratten, Jack R. Method and apparatus for filtration of contaminated liquids. 4,407,720., Cl. 210-777.000.

Braun, Ernst; and Braun, Gert, to Halbach & Braun. Mining planer with pivotal tool holder. 4,407,546., Cl. 299-34.000.

Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 4,407,546., Cl. 299-34.000.

Braun, Reinhold, to International Standard Electric Corporation. Digital phase detector. 4,408,165., Cl. 328-134.000.

Braunagel, Egon V.: *See*—
Cornelius, Jack M.; and Braunagel, Egon V., 4,407,510., Cl. 277-12.000.

Brefka, Paul E., to Energy Harvesters Corporation. Wood stove air flow regulating. 4,407,265., Cl. 126-193.000.

Breidenbach, Dieter: *See*—
Flockenhaus, Claus; Wagener, Dietrich; Hackler, Erich; Smieskol, Stefan; Galow, Manfred; Meckel, Joachim; and Breidenbach, Dieter, 4,407,699., Cl. 201-39.000.

Brenner, Robert A., to Whirlpool Corporation. Weight indicator for refuse compactor. 4,407,191., Cl. 100-99.000.

Bret, Georges G.: *See*—
Michelet, Guy A.; and Bret, Georges G., 4,407,567., Cl. 350-423.000.

Brezny, Bohus, to Armco Inc. Erosion-resistant refractory. 4,407,972., Cl. 501-99.000.

Bricot, Claude; and Robin, Gerard, to Thomson-Brandt. Apparatus for making video discs. 4,407,646., Cl. 425-174.400.

Bridges Electric, Inc.: *See*—
McBride, Joseph R., 4,408,155., Cl. 324-51.000.

Briere, Alfred D., to GTE Laboratories Incorporated. Methods for prolonging the useful life of a graphite element in an optical fiber-drawing furnace. 4,407,666., Cl. 65-2.000.

Briscoe, James E.: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,408,043., Cl. 544-87.000.

Bristol-Myers Company: *See*—
Cundall, Robert L.; and Walker, Derek, 4,407,755., Cl. 260-245.20R.

British Aerospace Public Limited Company: *See*—
Simms, Graham J., 4,407,583., Cl. 356-350.000.

British-American Tobacco Company Limited: *See*—
Baker, Richard R.; and Dashley, Federick J., 4,407,308., Cl. 131-336.000.

British Petroleum Company Limited, The: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,407,728., Cl. 502-60.000.

British Steel Corporation: *See*—
Gladman, Terence; and Ballinger, Nicholas K., 4,407,680., Cl. 148-12.00F.

Britt, James M.: *See*—
Widener, Joseph; Britt, James M.; and LaPrade, Steve A., 4,407,969., Cl. 501-95.000.

Britt, Kenneth W.: *See*—
Harbin, Wayne D.; Stark, Marvin; and Britt, Kenneth W., 4,407,203., Cl. 105-462.000.

Broadfoot, John T.; and Broadfoot, John T., Jr. Metering and/or feeding device for materials. 4,407,436., Cl. 222-636.000.

Broadfoot, John T., Jr.: *See*—
Broadfoot, John T.; and Broadfoot, John T., Jr., 4,407,436., Cl. 222-636.000.

Brodbeck, Robert M., to Marcamor, Inc. Automatic telephone dialing apparatus with magnetic switch assembly. 4,408,101., Cl. 179-90.0BD.

Brother Kogyo Kabushiki Kaisha: *See*—
Kurachi, Hisao; Ito, Takeo; and Onoda, Hiroshi, 4,407,592., Cl. 400-54.000.
Okamoto, Takachiyo, 4,408,138., Cl. 310-12.000.

Brotherston, Colin P.; and Adey, Anthony J., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,407,644., Cl. 417-462.000.

Brotzmann, Karl; and Fassbinder, Hans-Georg, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Method and a means for introducing close-grained carbonaceous fuels into an iron melting bath. 4,407,490., Cl. 266-266.000.

Brouwer, Charles W., to Leesona Corporation. Method and apparatus for positively removing weft from air insertion guidance tube. 4,407,334., Cl. 139-435.000.

Brown, Arthur K., to Bendix Corporation, The. Power fluid system embodying two-fluid pump. 4,407,643., Cl. 417-401.000.

Brown, David J., to Lucas Industries Limited. Secondary zinc electrode. 4,407,915., Cl. 429-217.000.

Brown, Harry E., to Buckeye Cellulose Corporation, The. Tree feller with gravitational buncher. 4,407,343., Cl. 144-34.00E.

Brown, Kenneth: *See*—
Bernot, Anthony J.; and Brown, Kenneth, 4,407,658., Cl. 445-25.000.

Brown, Richard S., Jr.: *See*—
MacDermott, Carl H.; and Brown, Richard S., Jr., 4,407,075., Cl. 33-348.200.

Brown, Robert J. S., to Chevron Research Company. Computer-controlled, portable spin echo NMR instrument and method of use. 4,408,161., Cl. 324-303.000.

Brozovich, Roy S.; and Moore, Prentice G., to Square D Company. Frequency transducer. 4,408,158., Cl. 324-78.00R.

Bruce, Richard H.; and Reinberg, Alan R., to Perkin-Elmer Corporation, The. Profile control photoresist. 4,407,850., Cl. 427-38.000.

Bruck, Herbert; Steinbuchel, Gunter H.; Hofmann, Hans; Busch, Josef; and Hoffacker, Franz, to Agfa-Gevaert Aktiengesellschaft. Apparatus and a method for the completely automatic lacquering of strip-form materials. 4,407,867., Cl. 427-365.000.

Bruckner, Peter J. Gripping device. 4,407,626., Cl. 414-740.000.

Brune, Arlen G.; and Schmidt, Nelson, to Glasscock, Gus. Infield mobile syrup extractor. 4,407,111., Cl. 56-16.400.

Brunswick Corporation: *See*—
Wilhelm, Raymond L., 4,407,326., Cl. 137-553.000.

Bucheder, Erwin, to Koflach Sportgerate Gesellschaft m.b.H. Buckle for fastening together the parts of a shoe. 4,407,048., Cl. 24-69.0SK.

Buckeye Cellulose Corporation, The: *See*—
Brown, Harry E., 4,407,343., Cl. 144-34.00E.

Budinger, A. Bowman: *See*—
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Budzowski, Ronald L., to General Tire & Rubber Company, The. Apparatus and method of applying an elongated strip to a tire component building drum. 4,407,684., Cl. 156-133.000.

Bullard, Harold L.: *See—*
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Bulley, Raymond M.; MacPherson, William F.; and Youhas, Robert F., to Bell Telephone Laboratories, Incorporated. Protection circuit. 4,408,248., Cl. 361-91.000.

Burdekin, Norman: *See—*
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Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.

Burns, Orville M., Jr.: *See—*
Hardman, Charles A.; and Burns, Orville M., Jr., 4,407,154., Cl. 73-66.000.

Burr, Peter; Chase, Brian D.; Paton, Andrew; and Sowter, Brian R., to International Business Machines Corporation. Method and apparatus for determining beam dimensions at the screen of a shadow mask cathode-ray tube. 4,408,163., Cl. 324-404.000.

Burrage, Robert G., to Lucas Industries Limited. Gas turbine engine fuel control system. 4,407,118., Cl. 60-39.281.

Burroughs Corporation: *See—*
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Neill, Jimmie; Webb, Nathaniel; and Hartig, Norman F., 4,408,343., Cl. 382-52.000.
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Burton, John H.; Staehle, Bradford G.; and Kuyava, Charles C., to American Medical Systems, Inc. Penile prosthesis with improved fluid control. 4,407,278., Cl. 128-79.000.

Busch, Josef: *See—*
Bruck, Herbert; Steinbuchel, Gunter H.; Hofmann, Hans; Busch, Josef; and Hoffacker, Franz, 4,407,867., Cl. 427-365.000.

Bush, Alvin A.: *See—*
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Bushaw, Kenneth A.; Gillingham, Ronald D.; Jorgenson, Gary W.; Manning, Clyde L.; and Steffes, Michael A., to International Business Machines Corporation. Method and apparatus for calibrating a linear array scanning system. 4,408,231., Cl. 358-280.000.

Buss, Albert, to G. O. Stumpf GmbH & Co. Apparatus for depositing a web of material on a table. 4,407,439., Cl. 226-20.000.

Butler, David S.: *See—*
Hines, Howard E.; Hardy, Rex F. G.; and Butler, David S., 4,407,337., Cl. 140-124.000.

Butler, Gordon K.; and Beeson, Don E., to Cummins Engine Company, Inc. Expandable hydraulic tappet with a variable exit valve. 4,407,241., Cl. 123-90.160.

Butler, James G. Apparatus for supplying high voltage pulses. 4,407,255., Cl. 123-595.000.

Butterwick, Gilbert N., to RCA Corporation. Method for processing a lithium-sodium-antimony photocathode. 4,407,857., Cl. 427-74.000.

Butterworth Systems Inc.: *See—*
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Buzgo, Alexander W., to RCA Corporation. Spacer for use in testing information recorded discs. 4,408,320., Cl. 369-290.000.

Buzzi, Gunter, to Hans Grohe GmbH & Co. KG. Rubber articles, particularly moulded rubber articles for use in sanitary fittings. 4,407,890., Cl. 428-408.000.

B.V. Neratoom: *See—*
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Byrne, Joseph B., to Dow Chemical Company, The. Flame retardant polycarbonates. 4,408,005., Cl. 524-421.000.

Byszewski, Wojciech W.; Budinger, A. Bowman; and Proud, Joseph M., to GTE Laboratories Incorporated. Dual cathode beam mode fluorescent lamp. 4,408,141., Cl. 315-56.000.

C. A. Weidmuller GmbH & Co.: *See—*
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C-I-L Inc.: *See—*
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C & J Clark Limited: *See—*
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Caddell, John P. Valve stem cover apparatus. 4,407,324., Cl. 137-382.000.

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Caruso, Vincent C.; and Caruso, Andrew, 4,407,507., Cl. 273-400.000.

Caruso, Peter J., to Bendix Corporation, The. Electromechanical decoder. 4,408,188., Cl. 340-345.000.

Caruso, Vincent C.; and Caruso, Andrew. Portable soccer goal. 4,407,507., Cl. 273-400.000.

Casciari, Raoul: *See—*
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Casden, Martin S., to Soundcraft, Inc. Key card and method of manufacturing same. 4,408,122., Cl. 235-449.000.

Catanzarite, Vincent O. Anode neutralization. 4,407,910., Cl. 429-57.000.

Caterpillar Tractor Co.: *See—*
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Centre National de la Recherche Scientifique (CNRS): *See—*
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Ceramatec, Inc.: *See—*
Virkar, Anil V.; and Miller, Gerald R., 4,407,912., Cl. 429-104.000.

Cerutti, Henry P.; Cannon, Robert A.; and Lindbloom, George G., to White Consolidated Industries, Inc. Apparatus and method for providing negative buoyancy for tunnel forms. 4,407,609., Cl. 405-146.000.

Ceskoslovenska akademie ved: *See—*
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Chadwick, Henry D.; and Matthews, David W., to Satellite Business Systems. Method and apparatus for measuring signal to noise ratio in a TDMA communications system. 4,408,322., Cl. 370-17.000.

Champion International Corporation: *See—*
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McLaren, Edwin C.; and Adamek, David J., 4,407,426., Cl. 220-306.000.

Chan, David C. K., to Chevron Research Company. Fungicidal 3-(N-acyl-N-arylamino)- and 3-(N-thionoacyl-N-arylamino)-gamma-butyrolactones and gamma-thiobutyrolactones. 4,407,817., Cl. 424-275.000.

Chase, Brian D.: *See—*
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Chatfield, David A.: *See—*
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Chatterjea, Probir K.: *See*—
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Chegolya, Alexandr S.; Malykh, Vladimir A.; Chizhov, Vladimir V.; Yankov, Viktor I.; and Pirog, Nikolai I. Method of aerodynamic production of liquid and solid disperse aerosols. 4,407,450., Cl. 239-8.000.
Chemie Linz Aktiengesellschaft: *See*—
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Cherpeck, Richard E., to Chevron Research Company. Fungicidal, herbicidal and plant growth regulating pyridyl-containing ethers. 4,407,806., Cl. 424-263.000.
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Culver, Norman D., 4,407,299., Cl. 128-731.000.
Chiovini, Jacky; Margolis, Geoffrey; and Blanc, Maurice, to Societe d'Assistance Technique pour Produits Nestle S.A. Recovery of xanthine stimulants from aqueous media. 4,407,834., Cl. 426-422.000.
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Ohno, Hideshi; Kume, Kazunari; Osaka, Takatoshi; Nishimura, Katsuo; Tamaru, Munetaka; and Ode, Sadao, 4,407,590., Cl. 368-204.000.
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Clorox Company, The: *See*—
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Clyde, Robert A. Fiber fermenter. 4,407,954., Cl. 435-161.000.
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Colborn, David W.; Coyne, Thomas S.; Emrie, Carolyn P.; and Munk, Barbara H., to Clorox Company, The. Movement activated odor control animal litter. 4,407,231., Cl. 119-1.000.
Cole, Francis X.; and Van Voorhis, Deborah M., to Millipore Corporation. Immobilized antibody or antigen for immunoassay. 4,407,943., Cl. 435-7.000.
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Collins, Thomas W.; and Croskey, Charles L., to Optimizer Control Corporation. Self-optimizing voltage control of an induction motor. 4,408,149., Cl. 318-729.000.
Colon, George M., Jr. Pool-cover apparatus and method. 4,407,027., Cl. 4-502.000.
Com-Dor Supply Limited: *See*—
Huelsekopf, Alfred G., 4,407,100., Cl. 52-212.000.
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Combs, Marvin. Container closure lid including drinking spout means. 4,407,425., Cl. 220-269.000.
Combustion Engineering, Inc.: *See*—
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Commissariat a l'Energie Atomique: *See*—
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Conners, John A., to Scott & Fetzer Company, The. Scissors with cushioned stop. 4,407,069., Cl. 30-254.000.
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Cook, Clarence E.; Smith, Glynn E.; and Monaghan, Richard C., to United States of America, National Aeronautics and Space Administration. Inflatable device for installing strain gage bridges. 4,407,686., Cl. 156-215.000.
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Cooper, Stephen M.; Shafer, Sheldon J.; and Tyrell, John A., to General Electric Company. Stabilized polycarbonate compositions. 4,407,996., Cl. 524-167.000.
Cooperman, Michael; and Geller, William L., to GTE Laboratories Incorporated. Comparator circuit with improved reliability and/or speed. 4,408,133., Cl. 307-362.000.
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Core, Grant M. Method and means for wrapping round bales. 4,407,113., Cl. 56-341.000.
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Cote, Paul T., to General Electric Company. Dual voltage power supply with input filter. 4,408,154., Cl. 323-340.000.
Cotrel, Claude; Farge, Daniel; and Taurand, Gerard, to Rhone-Poulenc Sante. 1,2-Dithiol-3-ylideneammonium derivatives, compositions and use. 4,407,797., Cl. 424-246.000.
Covington, Robert A., Jr.; and Ekiner, Okan M., to Du Pont de Nemours, E. I., and Company. In-line coagulation process for fluoroelastomer emulsions. 4,408,038., Cl. 528-485.000.
Cowell, David, to Sybron Corporation. High voltage protection circuit for x-ray systems. 4,408,247., Cl. 361-79.000.
Coyne, Thomas S.: *See—*
Colborn, David W.; Coyne, Thomas S.; Emrie, Carolyn P.; and Munk, Barbara H., 4,407,231., Cl. 119-1.000.
Crabb, Trevor A.; Jackson, Graham C.; and Jupp, Philip A., to National Research Development Corporation. Biocidal compounds and compositions. 4,407,670., Cl. 71-67.000.
Craig, Stephen R., to Du Pont de Nemours, E. I., and Company. Apparatus and method for powder bagging. 4,407,108., Cl. 53-451.000.
Crandall, Melvin. Umbrella reversal prevention structure. 4,407,317., Cl. 135-27.000.
Crawford, John O.: *See—*
Noiles, Douglas G.; and Crawford, John O., 4,407,286., Cl. 128-334.00R.
Crepy, Gilles: *See—*
Appleby, Anthony J.; and Crepy, Gilles, 4,407,908., Cl. 429-45.000.
Cretaz, Franco: *See—*
Adamoli, Contardo; Bernardis, Francesco; Cretaz, Franco; and Gaiardo, Mario, 4,407,591., Cl. 400-124.000.
Critikon: *See—*
Lentz, David J.; and Houghton, Richard B., 4,407,298., Cl. 128-713.000.
Crivello, James V., to General Electric Company. Photoinitiators. 4,407,759., Cl. 260-440.000.
Crocker, Zenas; and Wise, David V., to Synergistics Chemicals Limited. Polymeric resins and blends with high packing densities. 4,407,987., Cl. 523-322.000.
Crofts, David, to Raychem Limited. Dimensionally recoverable article with adhesive portion. 4,407,888., Cl. 428-355.000.
Cromemco Inc.: *See—*
Kausch, Marvin L., 4,407,536., Cl. 292-29.000.
Croskey, Charles L.: *See—*
Collins, Thomas W.; and Croskey, Charles L., 4,408,149., Cl. 318-729.000.
Croslin, Michael E., to Medtek Corporation. Method and apparatus for performing non-invasive blood pressure and pulse rate measurements. 4,407,297., Cl. 128-681.000.
Crossley, Thomas J.; and Zinge, Thomas P., to Westinghouse Electric Corp. Method of separating molybdenum from uranium. 4,407,781., Cl. 423-15.000.
Crumb, Donald A., to Bendix Corporation, The. Master cylinder. 4,407,121., Cl. 60-562.000.
Culshaw, Brian; Ball, Peter R.; Kingsley, Stuart A.; and Davies, David E. N., to National Research Development Corporation. Signal transmission systems. 4,408,354., Cl. 455-610.000.
Culver, Norman D., to Children's Medical Center Corporation, The. Brain electrical activity mapping. 4,407,299., Cl. 128-731.000.
Cummins Engine Company, Inc.: *See—*
Butler, Gordon K.; and Beeson, Don E., 4,407,241., Cl. 123-90.160.
Cundall, Robert L.; and Walker, Derek, to Bristol-Myers Company. 6-Amino penam derivatives. 4,407,755., Cl. 260-245.20R.
Cushman Electronics, Inc.: *See—*
Bradley, Jack, 4,408,227., Cl. 358-139.000.
Cyr, Reno R. J. Unique fan-powered water vessel. 4,407,215., Cl. 114-289.000.
D. L. Auld Company, The: *See—*
Waugh, Robert E., 4,407,421., Cl. 215-12.00R.
Waugh, Robert E., 4,407,421., Cl. 215-12.00R.
Daghe, Joseph L.; and Sands, Robert E., to Mueller Co. Coupling joint for telescoping tubular members. 4,407,482., Cl. 251-148.000.
Dahmen, Kurt: *See—*
Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, 4,408,073., Cl. 564-204.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Shima, Mutsuo; Aoyama, Kensuke; and Naka, Michiro, 4,407,881., Cl. 428-156.000.
Daido Tokushuko Kabushiki Kaisha: *See—*
Sawa, Shigeki; Nagasaka, Hiroyasu; Saito, Makoto; Mizuno, Masashi; and Kozima, Katuhiro, 4,407,682., Cl. 148-128.000.
Daihatsu Motor Co., Ltd.: *See—*
Kawakatsu, Shiro; and Honda, Shoji, 4,407,132., Cl. 60-716.000.
Daimler-Benz Aktiengesellschaft: *See—*
Koukal, Heinz; and Grimm, Hermann, 4,407,167., Cl. 74-501.00R.
d'Alayer de Costemore d'Arc, Stephane M.; and Lockey, David J., to Staar S. A. Method and apparatus for controlling tape transport apparatus for cassettes. 4,408,335., Cl. 377-18.000.
Damon Corporation: *See—*
Lim, Franklin, 4,407,957., Cl. 435-178.000.
Dana Corporation: *See—*
Patel, Hiralal V.; and Rudolph, Samuel A., 4,407,532., Cl. 285-256.000.
Daniel, Hugh O., deceased; and by Daniel, Lucille W., administratrix. Mixing nozzle. 4,407,456., Cl. 239-423.000.
Daniel, Lucille W., administratrix: *See—*
Daniel, Hugh O., deceased; and Daniel, Lucille W., administratrix, 4,407,456., Cl. 239-423.000.
Danielson, Robert L.: *See—*
Bosco, Peter M.; and Danielson, Robert L., 4,407,836., Cl. 426-576.000.
Danly Machine Corporation: *See—*
Tack, Carl E., Jr.; and Heiberger, Francis E., 4,408,281., Cl. 364-476.000.
Dapo, Roland F., to North American Philips Corporation. Aluminum electrode capacitor and glycol fill electrolyte therefor. 4,408,258., Cl. 361-433.000.
DasGupta, Sumit, to International Business Machines Corp. High speed binary counter. 4,408,336., Cl. 377-34.000.
Dashley, Federick J.: *See—*
Baker, Richard R.; and Dashley, Federick J., 4,407,308., Cl. 131-336.000.
Data Plus, Inc.: *See—*
Pritz, George E.; and Novakowski, Robert, 4,408,100., Cl. 179-27.00D.
Dataproducts Corporation: *See—*
Jezbera, Val K., 4,407,194., Cl. 101-93.340.
Davey-Loewy Limited: *See—*
Gronbech, Robert W., 4,407,151., Cl. 72-241.000.
Davidson, John R.; and Heyman, Joseph S. Error correction method and apparatus for electronic timepieces. 4,407,589., Cl. 368-201.000.
Davies, David E. N.: *See—*
Culshaw, Brian; Ball, Peter R.; Kingsley, Stuart A.; and Davies, David E. N., 4,408,354., Cl. 455-610.000.
Davies, James F.; and Tune, John B., to Lever Brothers Company. Fabric washing process and detergent composition for use therein. 4,407,722., Cl. 252-91.000.
Davila, Jose E.; and Gomez, Jim H., to General Railway Signal Company. Fare collection system and components thereof. 4,407,312., Cl. 133-8.00R.

Davis, Dean T.: *See*—
Sisson, Edwin D.; Morrow, Robert S.; Stoutenburg, Donn V.; and Davis, Dean T., 4,408,285., Cl. 364-508.000.

Davis, Richard L.; Graf, Harlan G.; Edwards, Don L.; and Macbeth, William B., Jr., to Conoco Inc. Injector for calciner. 4,407,700., Cl. 202-85.000.

Davis, Robert E. Potentiometric diagnosis of cancer in vivo. 4,407,300., Cl. 128-734.000.

Davydov, Anatoly B.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.

Dawson, John W.: *See*—
Theodosiou, George E.; and Dawson, John W., 4,408,297., Cl. 364-569.000.

Dean, Andrew; and Hutt, Peter R., to Independent Broadcasting Authority. Test apparatus for monitoring digital transmissions. 4,408,226., Cl. 358-139.000.

Deaner, Frederick R., to Eaton Industries, Inc. Tool for wood dowel striation. 4,407,342., Cl. 144-2.00R.

De Boer, Rudolf: *See*—
Lippe, Frank; Ottenhof, Henricus A. W. E. M.; and De Boer, Rudolf, 4,407,747., Cl. 260-120.000.

de Cachard, Maurice B.: *See*—
Berger, Raymond; de Cachard, Maurice B.; Collet, Alain; Costes, Didier; Gouzy, Andre; Dupuy, Guy; Caunes, Pierre; and Chevrier, Claude, 4,407,359., Cl. 165-167.000.

Decavele, Dominique, to Transac-Alcatel-Compagnie pour le Development des Transactions Automatiques. Individualized portable object such as a credit card. 4,408,119., Cl. 235-382.000.

Decker, Wilton K. Warning light housing. 4,408,264., Cl. 362-200.000.

Deckman, Harry W.; and Dunsmuir, John H., to Exxon Research and Engineering Co. Natural lithographic fabrication of microstructures over large areas. 4,407,695., Cl. 156-643.000.

Decuyper, Jean-Claude: *See*—
Nahon, Richard; and Decuyper, Jean-Claude, 4,408,233., Cl. 358-284.000.

Deepsea Ventures, Inc.: *See*—
Latimer, John P.; and Miller, Glenn E., 4,407,716., Cl. 210-155.000.

Deere & Company: *See*—
Cheatum, Leo G., 4,407,190., Cl. 100-88.000.
Fichtinger, Gary R., 4,407,400., Cl. 192-12.00C.

Degawa, Takashi: *See*—
Sasaya, Kazushi; Degawa, Takashi; Suginuma, Atsushi; and Sato, Noriharu, 4,407,638., Cl. 417-269.000.

DeGraff, Harold F., Jr., to Sybron Corporation. Slant culture tube rack. 4,407,958., Cl. 435-287.000.

de Jager, Arie, to IHC Holland N.V. Ship comprising one or more derricks such as a dredge with suction pipe derricks. 4,407,420., Cl. 212-199.000.

de Kanter, Scipio, to Halliburton Company. Downhole tool cooling system. 4,407,136., Cl. 62-64.000.

DeLau, Bruce E. Portable quick chilling and heating appliance. 4,407,356., Cl. 165-132.000.

Dellevoet, John C., to Schlegel Corporation. Pile brush for conditioning a moving surface. 4,407,219., Cl. 118-60.000.

Denet, Robert W.: *See*—
Haviv, Fortuna; and Denet, Robert W., 4,407,803., Cl. 424-258.000.

Deng, Shye-Yih. Safety boiler with high efficiency. 4,407,235., Cl. 122-161.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Yui, Tohru; Hirai, Hachiro; and Takamaru, Ken, 4,407,863., Cl. 427-213.000.

Denner, Peter; Ernst, Egon; and Jockel, Alfred, to Balcke-Durr Aktiengesellschaft. Apparatus for pulling transverse fins onto a plurality of pipes. 4,407,064., Cl. 29-726.000.

Dennison Manufacturing Company: *See*—
Fotland, Richard A.; and Beaudet, Leo A., 4,408,214., Cl. 346-159.000.
Pitts, Warren R., 4,407,856., Cl. 427-54.100.

Denton, Dean A.; and Feldwick, Raymond D., to W. R. Grace & Co. Spray dried vanadia catalyst and method of preparing it. 4,407,734., Cl. 502-9.000.

Denzler, Rudolph E., to Colgate-Palmolive Company. Soap plodder for elimination of wet cracking. 4,407,647., Cl. 425-208.000.

DePasquale, Ralph J.; and Schuman, Paul D., to PCR Incorporated. Process for making 5-fluorouracil. 4,408,048., Cl. 544-313.000.

Derkach, Galina M.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.

deRosset, Armand J.; Priegnitz, James W.; and Landis, Arthur M., to UOP Inc. Process for the separation of methylparaben from wintergreen oil. 4,408,065., Cl. 560-67.000.

Desmier, Pierre: *See*—
Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,407,584., Cl. 366-279.000.

Deuschle, Roger A.; and Mueller, Charles P., to International Mill Service, Inc. Method for the recovery of iron units from flue dust generated in a steel making process. 4,407,672., Cl. 75-10.00R.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See*—
Schwarz, Rudolf; Kleinschmit, Peter; Liedtke, Christa; and Wolff, Siegfried, 4,408,064., Cl. 556-427.000.

Devissaguet, Michelle: *See*—
Arnaud, Jean-Claude; and Devissaguet, Michelle, 4,407,801., Cl. 424-250.000.

DeZeeuw, John R.; and Stasko, Irene, to Pfizer Inc. Fermentation process for production of alpha-isopropylmalic acid. 4,407,953., Cl. 435-145.000.

Dhein, Rolf: *See*—
Hocker, Jurgen; Wieder, Wolfgang; and Dhein, Rolf, 4,408,027., Cl. 526-185.000.

Diacont, George P., Jr.: *See*—
Jung, Wilhelm H.; and Diacont, George P., Jr., 4,407,210., Cl. 112-167.000.

Diamond Giken Co., Ltd.: *See*—
Murata, Yasunori, 4,407,263., Cl. 125-15.000.

Diasonics, Inc.: *See*—
Suarez, Joe R., Jr.; Schwartz, Henry L.; Rossetti, Anthony J.; and Corl, Paul D., 4,407,293., Cl. 128-660.000.

Dick, Heinz, to Ford Motor Company. Lamp, in particular for motor vehicles. 4,408,265., Cl. 362-238.000.

Dick, Kevin F., to Dow Chemical Company, The. Stabilized polycarbonate compositions containing cyclic carbonates and organophosphorous compounds. 4,407,995., Cl. 524-108.000.

Dicke, William C., to Singer Company, The. Dovetail fixture. 4,407,344., Cl. 144-87.000.

Didier Engineering GmbH: *See*—
Flockenhaus, Claus; Wagener, Dietrich; Hackler, Erich; Smieskol, Stefan; Galow, Manfred; Meckel, Joachim; and Breidenbach, Dieter, 4,407,699., Cl. 201-39.000.
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,407,974., Cl. 518-711.000.
Wagener, Dietrich; Fach, Horst; Sauder, Peter; and Abel, Otto, 4,407,701., Cl. 202-99.000.

Diehl GmbH & Co.: *See*—
Bender, Richard; and Feuerstake, Eugen, 4,407,200., Cl. 102-202.500.

Diesel Kiki Company, Ltd.: *See*—
Takishita, Takashi; Sutoh, Shinji; Tanaka, Noriyuki; Kobayashi, Takashi; and Furukawa, Kenji, 4,407,354., Cl. 165-42.000.

Diffracto Ltd.: *See*—
Pryor, Timothy R.; and Hageniers, Omer L., 4,407,379., Cl. 177-52.000.

Digital Equipment Corporation: *See*—
Gershnow, Abraham H., 4,407,595., Cl. 400-212.000.

DiGiulio, Adolph V., to Atlantic Richfield Company. Process for forming fast-cool vinyl aromatic expandable polymers. 4,407,979., Cl. 521-59.000.

Dilley, James E.: *See*—
Betts, Malcolm C.; Graves, Alan F.; Pascoe, Frederick M.; and Dilley, James E., 4,408,189., Cl. 340-347.0DD.

Dilliner, Monte M., to Jones, Oscar E.; Lowe, Ted; and Robinson, Robert H., a part interest. Fuel injection system. 4,407,252., Cl. 123-504.000.

Disque, Donny R.: *See*—
Sollner, George H.; Disque, Donny R.; and Knerr, Allan R., 4,408,032., Cl. 528-48.000.

DNA Medical, Inc.: *See*—
Steuer, Robert R.; Rogers, Robert K.; and Horne, Robert H., 4,407,295., Cl. 128-670.000.

Dobramysl, Wilhelm; Stern, Gerhard; and Raml, Walter, to Chemie Linz Aktiengesellschaft. Process for the preparation of partially etherified methylolmelamines. 4,408,045., Cl. 544-196.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,407,702., Cl. 202-263.000.

Dr. Franz & Rutenbeck: *See*—
Wilmsmann, Hans-Peter; and Koch, Fritz E., 4,407,471., Cl. 248-63.000.

Dr. Lo. Zambeletti S.p.A.: *See*—
Signorini, Massimo; Trebbi, Attilio; and Molteni, Luigi, 4,408,074., Cl. 564-361.000.

Dr. Ruhland Nachf. GmbH: *See*—
Stemberger, Axel, 4,407,787., Cl. 424-28.000.

Doi, Shunichi: *See*—
Nakamura, Tomio; and Doi, Shunichi, 4,408,067., Cl. 560-215.000.

Dolhyj, Serge R.; and Paparizos, Christos, to Standard Oil Company. Motor fuel additives derived from shale oil. 4,407,661., Cl. 44-78.000.

Dollinger Corporation: *See*—
Hawley, Clyde W., 4,407,663., Cl. 55-347.000.

Domhan, Gerold; Hartl, Franz; and Vogelgsang, Kurt, to International Standard Electric Corporation. Internal locking arrangement for a switch machine. 4,408,111., Cl. 200-318.000.

Donath, Erwin. Enhanced selectivity signal receiver. 4,408,350., Cl. 455-206.000.

Dorner, Stefan: *See*—
Schretzmann, Klaus; Dorner, Stefan; and Schumacher, Gustav, 4,407,774., Cl. 376-300.000.

Doughty, Dennis J.: *See*—
Seymour, Raymond K.; and Doughty, Dennis J., 4,408,174., Cl. 335-20.000.

Dow Chemical Company, The: *See*—
Bertram, James L.; Ham, George E.; and Chen, Wuu-Nan, 4,408,062., Cl. 549-517.000.
Byrne, Joseph B., 4,408,005., Cl. 524-421.000.

Dick, Kevin F., 4,407,995., Cl. 524-108.000.
Ginter, Sally P.; and Hamlin, Percy J., 4,408,001., Cl. 524-376.000.
Hefner, Robert E., Jr., 4,408,033., Cl. 528-72.000.
Messick, Virginia B., 4,407,991., Cl. 524-83.000.
Shipley, Randall S.; Lowery, Kirby, Jr.; and Gibbs, Ronald L., 4,408,025., Cl. 526-119.000.

Dow Corning Corporation: *See*—
Marko, Ollie W., 4,408,030., Cl. 528-10.000.

Doyen, Jean: *See*—
Resneau, Jean C.; Cirio, Marius; and Doyen, Jean, 4,408,219., Cl. 357-80.000.

Doyle, Gerald, to Exxon Research and Engineering Co. Conversion of methanol to methyl acetate using iron-cobalt catalyst. 4,408,069., Cl. 560-232.000.

Drake, Charles A.; and Turk, Stanley D., to Phillips Petroleum Company. Polyamide from cycloaliphatic substituted nonane diamine. 4,408,037., Cl. 528-346.000.

Drake, Cyril F.; and Tripp, Mary, to International Standard Electric Corporation. Glass composition. 4,407,786., Cl. 424-14.000.

Drall, Jerry E. Electrical plug safety device. 4,407,554., Cl. 339-37.000.

Dreikorn, Barry A.; and Kramer, Kenneth E., to Eli Lilly and Company. Diphenylamine compounds. 4,407,820., Cl. 424-304.000.

Dresow, Bernd: *See*—
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; Bischoff, Ludwig; Penkert, Rosemarie; and Siefert, Eicke, 4,407,947., Cl. 435-85.000.

Dresser Industries, Inc.: *See*—
Hanson, Lloyd D.; and Purton, Robert M., 4,407,327., Cl. 137-625.300.
Lichtenberg, Heinz D., 4,407,157., Cl. 73-151.000.
Shore, Daniel B.; and Chatterjea, Probir K., 4,407,328., Cl. 137-625.600.

Dreyer, Heinz, to Amazonen Werke H. Dreyer. Drill having disk furrow openers. 4,407,207., Cl. 111-85.000.

Dril-Quip, Inc.: *See*—
Reimert, Larry E., 4,407,527., Cl. 285-27.000.

Du Pont Canada Inc.: *See*—
Boocock, John R. B.; and Murray, Ronald E., 4,407,841., Cl. 426-656.000.
Elgie, John M., 4,407,982., Cl. 521-122.000.
White, George, 4,407,690., Cl. 156-244.270.

Dudding, Charles H., to Rockwell International Corporation. High power level mixer apparatus. 4,408,352., Cl. 455-295.000.

Duke, Gary L.: *See*—
Garscadden, Alan; Bailey, William F.; and Duke, Gary L., 4,407,705., Cl. 204-157.10H.

Dumas, David H.: *See*—
Bankert, Ralph A.; and Dumas, David H., 4,407,994., Cl. 524-107.000.

Dumas, Theodore A., to Rockwell International Corporation. Dip brazed corrugated feed horn. 4,408,208., Cl. 343-786.000.

Dunsmuir, John H.: *See*—
Deckman, Harry W.; and Dunsmuir, John H., 4,407,695., Cl. 156-643.000.

Du Pont de Nemours, E. I., and Company: *See*—
Covington, Robert A., Jr.; and Ekiner, Okan M., 4,408,038., Cl. 528-485.000.
Craig, Stephen R., 4,407,108., Cl. 53-451.000.
Gintis, Daniel; and Most, Elmer E., Jr., 4,407,889., Cl. 428-398.000.
Schmidt, Alfred J.; and Shearon, Michael H., 4,407,177., Cl. 83-300.000.
Schmidt, William K., 4,407,804., Cl. 424-260.000.
Schmidt, William K., 4,407,805., Cl. 424-260.000.
Wilis, Paul E., 4,408,002., Cl. 524-357.000.

Dupuy, Guy: *See*—
Berger, Raymond; de Cachard, Maurice B.; Collet, Alain; Costes, Didier; Gouzy, Andre; Dupuy, Guy; Caunes, Pierre; and Chevrier, Claude, 4,407,359., Cl. 165-167.000.

DuRoss, Robert M.: *See*—
Reiner, Barry C.; and DuRoss, Robert M., 4,407,596., Cl. 400-253.000.

Dutcher, Daniel P., to Champion International Corporation. Carton with suspension support and blank for forming same. 4,407,409., Cl. 206-45.310.

Duval, Eugene F.: *See*—
Backlund, Jonathan C.; and Duval, Eugene F., 4,407,477., Cl. 248-499.000.

Duvdevani, Ilan, to Exxon Research and Engineering Co. High impact polypropylene resin. 4,407,998., Cl. 524-229.000.

Dvorachek, Harold A.; and Klimek, Boleslaw M., to Echlin Inc. Electrical connector having threaded connection between receptacle parts. 4,407,553., Cl. 339-14.00P.

Dvoskin, Semen I.: *See*—
Gorbacheva, Irina N.; Kozinda, Zinaida J.; Suvorova, Elena G.; Chertov, Viktor A.; Dvoskin, Semen I.; Platonova, Evdokia V.; Podgaevskaya, Tatyana A.; and Skvirenko, Andrei B., 4,407,748., Cl. 260-153.000.

Dziuba, Peter; and Goeft, Manfred, to Zahnradfabrik Friedrichshafen, Aktiengesellschaft. Wheel head for driving wheels of vehicles. 4,407,382., Cl. 180-10.000.

Eads, Carl W.; and Haynes, Ronald L., to PPG Industries, Inc. Monomeric composition of a diol bis(allyl carbonate), a dispersed polymer, and a multifunctional acrylate monomer, and polymers prepared therefrom. 4,408,016., Cl. 525-277.000.

East, Phillip C.; and McGowan, Malcolm S., to Canada, Her Majesty the Queen in right of. Compensation circuit for radiation detectors. 4,408,164., Cl. 328-117.000.

Eastman Kodak Company: *See*—
Evans, Steven, 4,407,931., Cl. 430-223.000.
Joseph, Brian J., 4,407,576., Cl. 354-135.000.
Ross, Robert E.; Fleckenstein, Lee J.; and Campbell, Michael E., 4,407,930., Cl. 430-223.000.
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,408,029., Cl. 526-321.000.
Vanier, Noel R., 4,407,928., Cl. 430-214.000.
Weaver, Max A.; Coates, Clarence A., Jr.; and Fisher, John G., 4,407,749., Cl. 260-155.000.

Eaton Corporation: *See*—
Landau, Richard F., 4,407,708., Cl. 204-192.00R.
Nat, Gursharan P. S., 4,408,109., Cl. 200-153.00J.

Eaton Industries, Inc.: *See*—
Deaner, Frederick R., 4,407,342., Cl. 144-2.00R.

Eatwell, William D.; and Garner, James K., Jr., to Camco, Incorporated. Electrical feedthrough. 4,408,092., Cl. 174-88.00R.

Echlin Inc.: *See*—
Dvorachek, Harold A.; and Klimek, Boleslaw M., 4,407,553., Cl. 339-14.00P.

Eckert, Peter: *See*—
Hauser, Hanspeter; and Eckert, Peter, 4,407,882., Cl. 428-159.000.

Eckert, Theodor, to Ciba-Geigy Corporation. Pharmaceutical preparations for topical application which contain salts of alkanecarboxylic acids, novel carboxylic acid salts and the production thereof. 4,407,824., Cl. 424-329.000.

Ecklin, Gaston, to BBC Brown, Boveri & Company, Ltd. Totally enclosed surge arrester. 4,408,249., Cl. 361-127.000.

Economics Laboratory, Inc.: *See*—
Oakes, Thomas R.; and Sadler, James L., 4,407,790., Cl. 424-78.000.

Edmonson, Glenn V. Self-contained portable temperature-controlled chamber for medications and the like. 4,407,133., Cl. 62-3.000.

Edrich, Jochen. Procedure and apparatus for noncontacting measurement of subcutaneous temperature distributions. 4,407,292., Cl. 128-653.000.

Edwards, Don L.: *See*—
Davis, Richard L.; Graf, Harlan G.; Edwards, Don L.; and Macbeth, William B., Jr., 4,407,700., Cl. 202-85.000.

Edwards, Roy E., to Lucas Industries Limited. Hydraulic braking systems for vehicles. 4,407,547., Cl. 303-6.00A.

Egger, Herman, to Varian Associates, Inc. Sensitivity NMR probe. 4,408,162., Cl. 324-318.000.

Eheim, Franz, to Robert Bosch GmbH. Shutoff apparatus for fuel injection pumps. 4,407,245., Cl. 123-359.000.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for self-igniting internal combustion engines. 4,407,249., Cl. 123-449.000.

Eheim, Franz; Hofer, Gerald; and Links, Heins, to Robert Bosch GmbH. Fuel injection system. 4,407,250., Cl. 123-450.000.

Ehrenreich Electronics, Inc.: *See*—
Smith, Blaine M.; and Taylor, James A., 4,408,308., Cl. 367-197.000.

Ehrreich, John E., to Ercon, Inc. Novel electroconductive compositions and powder for use therein. 4,407,674., Cl. 75-251.000.

Eibe, Werner W., to White Consolidated Industries, Inc. Method for rotating and conveying coils. 4,407,407., Cl. 198-777.000.

Eigen, Edward; Brachman, Dina I.; and Friedman, Stuart D., to Colgate-Palmolive Company. Ground rice hulls in body powders. 4,407,789., Cl. 424-69.000.

Eilingsfeld, Heinz; Neumann, Peter; Seybold, Guenther; Lenke, Dieter; and Friedrich, Ludwig, to BASF Aktiengesellschaft. Thiazol-2-yl-oxamic acid derivatives, and therapeutic agents containing these compounds. 4,407,810., Cl. 424-270.000.

Eisai Co., Ltd.: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,407,745., Cl. 260-112.50R.

Eisenwerk-Gesellschaft Maximilianshutte mbH: *See*—
Brotzmann, Karl; and Fassbinder, Hans-Georg, 4,407,490., Cl. 266-266.000.

Eisfeller, Richard C., to Ex-Cell-O Corporation. Vacuum metallized dielectric substrates and method of making same. 4,407,871., Cl. 428-31.000.

Ekiner, Okan M.: *See*—
Covington, Robert A., Jr.; and Ekiner, Okan M., 4,408,038., Cl. 528-485.000.

Ekstrom, Lars A., to Raywall Kommanditbolag. Shielding windows. 4,407,349., Cl. 160-98.000.

Elder, David I. M. Weighing device for fluent material. 4,407,380., Cl. 177-145.000.

Elders, Gerald W. Stabilizer for an earth structure. 4,407,610., Cl. 405-259.000.

Electromark, division of Mohawk International Inc.: *See*—
Kitchen, William D., 4,408,215., Cl. 346-165.000.

Elgie, John M., to Du Pont Canada Inc. Process for the manufacture of foamed structures. 4,407,982., Cl. 521-122.000.

Elgue, Jean: *See*—
Blanc, Claude; Galy, Henry; and Elgue, Jean, 4,407,784., Cl. 423-228.000.

Eli Lilly and Company: *See*—
Dreikorn, Barry A.; and Kramer, Kenneth E., 4,407,820., Cl. 424-304.000.
Kukolja, Stjepan; and Pfeil, Janice L., 4,407,750., Cl. 260-239.00A.

Elings, Virgil B.; and Nicoli, David F., to University of California, The Regents of The. Homogeneous fluoroimmunoassay involving sensing radiation for forward and back directions. 4,407,964., Cl. 436-518.000.
Elliott Brothers (London) Limited: *See*—
Ellis, Stafford M., 4,407,564., Cl. 350-174.000.
Elliott, Franklin E., to Maxwell Products, Inc. Safety device for an adjustable bed. 4,407,030., Cl. 5-66.000.
Elliott, Kenneth L. Arrow lock. 4,407,261., Cl. 124-41.00A.
Ellis, Stafford M., to Elliott Brothers (London) Limited. Head-up displays. 4,407,564., Cl. 350-174.000.
Ellison, Arthur E. Surgical apparatus. 4,407,277., Cl. 128-82.000.
Elsmark A/S: *See*—
Rasmussen, Jorgen B., 4,408,185., Cl. 340-310.00A.
Emberger, Roland: *See*—
Kopsel, Manfred; and Emberger, Roland, 4,407,740., Cl. 252-522.00R.
Emerson Electric Co.: *See*—
Holston, Roger W.; and Hinesley, Carl P., 4,408,150., Cl. 318-779.000.
Emhart Industries, Inc.: *See*—
Walters, Charles W., 4,408,257., Cl. 361-433.000.
Emigh, Charles F.; and Goldin, Morris, to Hughes Helicopters, Inc. Tactical wire-cutter system for helicopters. 4,407,467., Cl. 244-17.110.
Emrie, Carolyn P.: *See*—
Colborn, David W.; Coyne, Thomas S.; Emrie, Carolyn P.; and Munk, Barbara H., 4,407,231., Cl. 119-1.000.
Endo, Shigeru: *See*—
Tanaka, Kenji; and Endo, Shigeru, 4,407,827., Cl. 426-19.000.
Endoh, Koichi: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,407,959., Cl. 435-288.000.
Energy Harvesters Corporation: *See*—
Brefka, Paul E., 4,407,265., Cl. 126-193.000.
Engel, John F., to FMC Corporation. 4-Heterocyclic-substituted-2-indanyl alcohols and insecticidal ester derivatives. 4,408,057., Cl. 548-562.000.
Engelhard Corporation: *See*—
Pfefferle, William C., 4,407,785., Cl. 423-659.000.
Engelhardt, Friedrich: *See*—
Wilski, Hans; Interthal, Werner; and Engelhardt, Friedrich, 4,407,321., Cl. 137-13.000.
Enjouji, Katsuhisa; Ikeizumi, Hiroshi; Murata, Kenji; and Nishikawa, Syozaburo, to Nippon Sheet Glass Co., Ltd. Method and apparatus for forming oxide coating by reactive sputtering technique. 4,407,709., Cl. 204-192.0SP.
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, to Honda Giken Kogyo Kabushiki Kaisha. Motor vehicle. 4,407,383., Cl. 180-54.00E.
Ensinger, James W.; and Hendrickson, Melvin C., to Zenith Radio Corporation. Subscription television decoder. 4,408,225., Cl. 358-120.000.
Erbstoesser, Steven R., to Exxon Production Research Company. Polyurethane ball sealers for well treatment fluid diversion. 4,407,368., Cl. 166-284.000.
Ercon, Inc.: *See*—
Ehrreich, John E., 4,407,674., Cl. 75-251.000.
Erickson, Allen H.: *See*—
Teletzke, Gerald H.; and Erickson, Allen H., 4,407,717., Cl. 210-616.000.
Eriksson, Sten: *See*—
Andersson, Nils E.; Eriksson, Sten; and Sinner, Bengt, 4,407,698., Cl. 162-258.000.
Ernsberger, Fred M., to PPG Industries, Inc. Low temperature reduction process for large photomasks. 4,407,891., Cl. 428-410.000.
Ernst, Egon: *See*—
Denner, Peter; Ernst, Egon; and Jockel, Alfred, 4,407,064., Cl. 29-726.000.
ESAB Aktiebolag: *See*—
Hansen, Erik, 4,407,621., Cl. 414-433.000.
Eskinazi, Victoria; Kirner, John F.; and Wilson, Charles R., to Air Products and Chemicals, Inc. Process for preparing a platinum/-rhodium catalyst. 4,407,738., Cl. 502-334.000.
Essex Group Inc.: *See*—
Young, Glen C., 4,408,299., Cl. 364-900.000.
Estberg, Magnus F. O., to Kenogard AB. Process for treating wood. 4,407,076., Cl. 34-9.500.
Estes, John H., to Texaco Inc. Crystalline zeolite HP. 4,407,782., Cl. 423-328.000.
Estes, Michael E.: *See*—
Wessells, Forrest; Startari, Joseph; and Estes, Michael E., 4,407,862., Cl. 427-144.000.
Estes, Michael S.: *See*—
Lieber, Clement E.; Cooper, Robert P.; and Estes, Michael S., 4,407,304., Cl. 128-786.000.
Estreicher, Herbert: *See*—
Flint, Dennis H.; and Estreicher, Herbert, 4,407,671., Cl. 71-113.000.
Etsion, Izhak, to Technion Research & Development Foundation Ltd. Zero-leakage non-contacting mechanical face seal for rotary machines. 4,407,509., Cl. 277-3.000.
Eu, Victor K.; Feng, Milton; Zielinski, Timothy T.; and Whelan, James M., to Hughes Aircraft Company. Multi-range doping of epitaxial III-V layers from a single source. 4,407,694., Cl. 156-606.000.
Eue, Ludwig: *See*—
Forster, Heinz; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,408,055., Cl. 548-125.000.
Evans, Peter R. Cleaning implement for boats. 4,407,213., Cl. 114-222.000.
Evans, Steven, to Eastman Kodak Company. Photographic products and processes employing nondiffusible yellow azo metal complexed dye-releasing compounds and precursors thereof. 4,407,931., Cl. 430-223.000.
Ex-Cell-O Corporation: *See*—
Eisfeller, Richard C., 4,407,871., Cl. 428-31.000.
Excel Industries: *See*—
Spretnjak, Steve A.; and Anthony, Colin, 4,407,093., Cl. 49-391.000.
Exxon Production Research Co.: *See*—
Cooke, Claude E., Jr., 4,407,365., Cl. 166-249.000.
Erbstoesser, Steven R., 4,407,368., Cl. 166-284.000.
Exxon Research and Engineering Co.: *See*—
Bartok, William; and Freund, Howard, 4,407,206., Cl. 110-347.000.
Deckman, Harry W.; and Dunsmuir, John H., 4,407,695., Cl. 156-643.000.
Doyle, Gerald, 4,408,069., Cl. 560-232.000.
Duvdevani, Ilan, 4,407,998., Cl. 524-229.000.
King, Nigel D., 4,407,636., Cl. 417-118.000.
Merchant, Philip, Jr.; and Smith, Dean L., Jr., 4,407,706., Cl. 204-190.000.
Merchant, Philip, Jr.; and Smith, Dean L., Jr., 4,407,707., Cl. 204-190.000.
Moustakas, Theodore D.; Morel, Don L.; and Abeles, Benjamin, 4,407,710., Cl. 204-192.00S.
Fabriques de Tabac Reunies, S.A.: *See*—
Gaisch, Helmut; Ghiste, Patrick D. L.; and Schulthess, Dieter, 4,407,307., Cl. 131-308.000.
Fach, Horst: *See*—
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Fafco, Inc.: *See*—
Backlund, Jonathan C.; and Duval, Eugene F., 4,407,477., Cl. 248-499.000.
Fales, John D. Electrokinetic display system. 4,408,202., Cl. 340-785.000.
Farge, Daniel: *See*—
Cotrel, Claude; Farge, Daniel; and Taurand, Gerard, 4,407,797., Cl. 424-246.000.
Farrell, Christopher J.; Tsai, Boh C.; and Wachtel, James A., to American Can Company. Drying agent in multi-layer polymeric structure. 4,407,897., Cl. 428-516.000.
Fassbinder, Hans-Georg: *See*—
Brotzmann, Karl; and Fassbinder, Hans-Georg, 4,407,490., Cl. 266-266.000.
Fatula, Joseph J., Jr.; Garbarino, Paul L.; and Shepard, Joseph F., to International Business Machines Corporation. Method of making dense vertical FET's. 4,407,058., Cl. 29-571.000.
Featherstone, William, to Imperial Chemical Industries PLC. Amine separation process. 4,407,703., Cl. 203-43.000.
Feldt, Adolf; Jarnuszak, Ulrich; Kiessling, Rolf; and Kock, Juergen, to Colgate-Palmolive Company. Apparatus for removing contents of damaged aerosol containers. 4,407,341., Cl. 141-97.000.
Feldwick, Raymond D.: *See*—
Denton, Dean A.; and Feldwick, Raymond D., 4,407,734., Cl. 502-9.000.
Feng, Milton: *See*—
Eu, Victor K.; Feng, Milton; Zielinski, Timothy T.; and Whelan, James M., 4,407,694., Cl. 156-606.000.
Ferguson, Andrew M.; and Malick, Howard M., to Mushroom Associates. Processing of mushrooms with reduced weight loss. 4,407,832., Cl. 426-281.000.
Ferguson, Gerald D., to United States of America, Navy. Laser device with intraresonator harmonic generator. 4,408,329., Cl. 372-21.000.
Ferrar, Carl M., to United Technologies Corporation. Fluid jet displacement detector. 4,407,161., Cl. 73-505.000.
Ferrofluidics Corporation: *See*—
Moskowitz, Ronald; Raj, Kuldip; and Kern, James L., 4,407,518., Cl. 277-1.000.
Raj, Kuldip; and Casciari, Raoul, 4,407,508., Cl. 277-1.000.
Fesmire, Lloyd W. Cement spraying machine for tires. 4,407,220., Cl. 118-64.000.
Fessel, Rudolf; von Knorre, Karl-Friedrich; Tillich, Peter; and Herbermann, Gottfried, to Olympia Werke AG. Word processor with display device. 4,408,302., Cl. 364-900.000.
Feuerstake, Eugen: *See*—
Bender, Richard; and Feuerstake, Eugen, 4,407,200., Cl. 102-202.500.
Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Drive unit. 4,407,398., Cl. 192-0.055.
Fichtinger, Gary R., to Deere & Company. Winch control valve. 4,407,400., Cl. 192-12.00C.
Figgie International Inc.: *See*—
Kralik, Douglas R.; and Mitchell, Hal D., 4,407,021., Cl. 2-416.000.
Firestone Tire & Rubber Company, The: *See*—
Gunesin, Binnur, 4,408,014., Cl. 525-218.000.
Maglio, Ralph A., 4,407,772., Cl. 264-294.000.
Fisher, John G.: *See*—
Weaver, Max A.; Coates, Clarence A., Jr.; and Fisher, John G., 4,407,749., Cl. 260-155.000.
Fisher & Paykel Limited: *See*—
Smith, Dennis E., 4,407,077., Cl. 34-108.000.
Fitch, John L.; and Spencer, Donald B., to Boeing Company, The. System for transmitting power from a solar satellite to earth and

subsequent conversion to a 60 Hertz three phase signal. 4,408,206., Cl. 343-352.000.

Flatau, Karsten, to Chemische Werke Huls Aktiengesellschaft. Production of polyvinyl chloride and acrylate copolymer modifier useful for high-speed calendar manufacture of sheet stock. 4,408,015., Cl. 525-227.000.

Fleckenstein, Lee J.: *See—*
Ross, Robert E.; Fleckenstein, Lee J.; and Campbell, Michael E., 4,407,930., Cl. 430-223.000.

Fleming, Rebecca P.; Lawhorne, Samuel, Jr.; Mele, John J.; and Prasad, Chandrika, to International Business Machines Corporation. Process for producing an improved quality electrolessly deposited nickel layer. 4,407,860., Cl. 427-98.000.

Flint, Dennis H.; and Estreicher, Herbert, to Shell Oil Company. Use of 3-aminocyclohexadienecarboxylic acids for controlling the growth of unwanted plants. 4,407,671., Cl. 71-113.000.

Flo-Tech Dampers, Inc.: *See—*
Cornelius, Jack M.; and Braunagel, Egon V., 4,407,510., Cl. 277-12.000.

Flock, John W.; and Matson, Stephen L., to General Electric Company. Slurry granulation-steam stripping process for solvent removal. 4,408,040., Cl. 528-500.000.

Flockenhaus, Claus; Wagener, Dietrich; Hackler, Erich; Smieskol, Stefan; Galow, Manfred; Meckel, Joachim; and Breidenbach, Dieter, to Didier Engineering GmbH. Process and apparatus for the dry cooling of coke. 4,407,699., Cl. 201-39.000.

Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, to Thyssengas GmbH; and Didier Engineering GmbH. Method of and apparatus for catalytic conversion of gases. 4,407,974., Cl. 518-711.000.

FMC Corporation: *See—*
Engel, John F., 4,408,057., Cl. 548-562.000.
Kempf, Dennis D., 4,407,434., Cl. 222-214.000.
Milberger, Lionel J.; Horn, Charles E.; and Kluttz, Marvin H., 4,407,183., Cl. 91-1.000.
Tullis, Barclay J.; Tan, Randy J.; and McKeon, John F., 4,408,195., Cl. 340-685.000.

Foerster, Hans-Juergen: *See—*
Merger, Franz; and Foerster, Hans-Juergen, 4,408,079., Cl. 568-463.000.

Foltier, Pierre: *See—*
Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,407,584., Cl. 366-279.000.

Fonderie et Ateliers des Sablons: *See—*
Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,407,584., Cl. 366-279.000.

Foote, Danny R., to Berkley and Company, Inc. Aramid reinforced thermocouple cable. 4,408,088., Cl. 136-226.000.

Foraison, Dominique; and Leveque, Alain, to Rhone-Poulenc Industries. Reductive stripping of uranium values from wet-process phosphoric acid. 4,407,780., Cl. 423-10.000.

Ford Aerospace & Communication Corporation: *See—*
Hankland, Lawrence B., 4,407,685., Cl. 156-212.000.

Ford Motor Company: *See—*
Boaz, Premakaran T., 4,407,847., Cl. 427-35.000.
Dick, Heinz, 4,408,265., Cl. 362-238.000.
Kummer, Joseph T.; and Oei, Djong-Gie, 4,407,902., Cl. 429-15.000.

Forenade Fabriksverken: *See—*
Backlund, Erik L., 4,407,351., Cl. 165-1.000.

Formanek, Frank J.: *See—*
Schukei, Glen E.; and Formanek, Frank J., 4,407,236., Cl. 122-390.000.

Forster, Heinz; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Azolyloxy-carboxylic acid n-oxy-amide compounds. 4,408,055., Cl. 548-125.000.

Forsyth, William G.: *See—*
MacGregor, Clive D. R.; and Forsyth, William G., 4,407,723., Cl. 252-192.000.

Forward, Kevin E.: *See—*
Ward, Geoffrey A.; and Forward, Kevin E., 4,408,192., Cl. 340-407.000.

Fosse, Navarro T., to Hydrotile Machinery Company. Counter rotating packerhead assembly. 4,407,648., Cl. 425-457.000.

Foster, Elton G., to Shell Oil Company. Process for oxidation of isobutane. 4,408,081., Cl. 568-571.000.

Fotland, Richard A.; and Beaudet, Leo A., to Dennison Manufacturing Company. Thermally regulated ion generation. 4,408,214., Cl. 346-159.000.

Foundacon BV: *See—*
van Weele, Abraham F., 4,407,612., Cl. 405-285.000.

Fowkes, Robert A., to Uniroyal, Inc. Belting fabric. 4,407,333., Cl. 139-415.000.

Fowler, David M., III, to Sperry Corporation. Key cycle timer control providing a universal keyboard. 4,408,191., Cl. 340-365.00R.

Fowler, John H., to Smith International, Inc. Packoff apparatus. 4,407,530., Cl. 285-140.000.

Fox, David A., to Westinghouse Electric Corp. Optically isolated solid state relay. 4,408,131., Cl. 307-311.000.

Fox, David A., to Westinghouse Electric Corp. Break-before-make solid state relay. 4,408,137., Cl. 307-598.000.

Fox, Stephen M., to RCA Corporation. Attitude control system for spacecraft utilizing the thruster plume. 4,407,469., Cl. 244-169.000.

Francis, Gerald T. Brick panel insulation with load bearing clip. 4,407,104., Cl. 52-309.400.

Frank, Wilhelm. Multi-pane insulating glass and method for its production. 4,407,105., Cl. 52-397.000.

Fransen, Jan J. B., to U.S. Philips Corporation. Gettering device and method. 4,407,657., Cl. 445-17.000.

Fraser, Allan B., to John Hopkins University, The. Frequency encoding closed loop circuit with transducer. 4,408,169., Cl. 331-65.000.

Fraser, David B.; and Watts, Roderick K., to Bell Telephone Laboratories, Incorporated. Alignment marks for electron beam lithography. 4,407,933., Cl. 430-296.000.

Freeman, Albert J. Seismic alarm system. 4,408,196., Cl. 340-690.000.

Frenchtown American Corp.: *See—*
Luks, Daniel W., 4,407,967., Cl. 501-81.000.

Freund, Howard: *See—*
Bartok, William; and Freund, Howard, 4,407,206., Cl. 110-347.000.

Friedman, Stuart D.: *See—*
Eigen, Edward; Brachman, Dina I.; and Friedman, Stuart D., 4,407,789., Cl. 424-69.000.

Friedrich, Ludwig: *See—*
Eilingsfeld, Heinz; Neumann, Peter; Seybold, Guenther; Lenke, Dieter; and Friedrich, Ludwig, 4,407,810., Cl. 424-270.000.

Friedrichsfeld GmbH, Steinzeug- und Kunststoffwerke: *See—*
Heimke, Gunther; and Griss, Peter, 4,407,022., Cl. 3-1.913.

Fromson, Bertram W. Opposed piston internal combustion engine with special scavenging means. 4,407,240., Cl. 123-56.0BC.

Fryberg, Mario; and Leppard, David G., to Ciba-Geigy AG. Photographic recording material. 4,407,935., Cl. 430-487.000.

Fuji Electric Co., Ltd.: *See—*
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,407,959., Cl. 435-288.000.

Fuji Photo Film Co., Ltd.: *See—*
Ichijima, Seiji; Watanabe, Toshiyuki; Furutachi, Nobuo; and Seto, Nobuo, 4,407,936., Cl. 430-505.000.
Miyatsuka, Hajime; Kasuga, Akira; and Yamada, Yasuyuki, 4,407,901., Cl. 428-694.000.
Naoi, Takashi; Kawasaki, Hiroshi; Yamaguchi, Jun; Tatsuta, Sumitaka; and Sera, Hidefumi, 4,407,939., Cl. 430-536.000.
Okita, Tsutomu; Naruo, Kyoichi; and Akashi, Goro, 4,407,853., Cl. 427-44.000.
Sugimoto, Naohiko; Maekawa, Yukio; and Ichikawa, Yasunori, 4,407,937., Cl. 430-527.000.

Fuji Xerox Co., Ltd.: *See—*
Itoh, Satoru, 4,408,232., Cl. 358-280.000.
Moriguchi, Fujio; and Kurata, Masami, 4,408,212., Cl. 346-76.0PH.

Fujii, Masanori: *See—*
Miyakawa, Nobuhiro; Fujii, Masanori; Maekawa, Kouzi; Koyama, Haruo; and Teshima, Takashi, 4,407,923., Cl. 430-106.600.

Fujii, Yasuhiko, to Victor Company of Japan, Limited. Data acquisition circuit. 4,408,333., Cl. 375-95.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Nakai, Yoshiharu; Sakane, Kazuo; and Goto, Jiro, 4,407,798., Cl. 424-246.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,408,042., Cl. 544-22.000.

Fujita, Masanori, to Seikosha Co., Ltd. Electronic timer. 4,407,587., Cl. 368-108.000.

Fujita, Noriko: *See—*
Suginaka, Shunji; Kobayashi, Ryuichiro; Ikeuchi, Satoru; Mizukura, Noboru; and Fujita, Noriko, 4,407,941., Cl. 430-566.000.

Fujita, Toshio, to Kett Electric Laboratory. Electric resistance type wide range moisture meter. 4,408,128., Cl. 324-65.00R.

Fujitsu Limited: *See—*
Higuchi, Mitsuo, 4,408,168., Cl. 331-57.000.
Sakurai, Junji, 4,407,060., Cl. 29-576.00E.

Fujiwara, Haruyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Pressure pulse absorbing device. 4,407,330., Cl. 138-30.000.

Fujizoki Pharmaceutical Co., Ltd.: *See—*
Kasahara, Yasushi; and Ashihara, Yoshihiro, 4,407,944., Cl. 435-18.000.

Fukai, Tamotsu: *See—*
Hagihara, Bunji; Fukai, Tamotsu; Nomura, Kikuo; Yoshida, Kenichi; and Isshiki, Isao, 4,407,291., Cl. 128-635.000.

Fukasawa, Akira; Yoshimura, Masakatsu; Kaneoya, Tatsuo; and Takahashi, Kenji, to Sumitomo Chemical Company, Limited. Process for producing aminoanthraquinone. 4,407,756., Cl. 260-378.000.

Fukui, Kiyozumi, to Teijin Seiki Company, Limited. Speed change device. 4,407,170., Cl. 74-805.000.

Fukuoka Paper Manufacturing Co., Ltd.: *See—*
Kato, Hideo; and Wada, Hiroto, 4,407,898., Cl. 428-542.800.

Fukuoka, Tatsuhiko: *See—*
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,407,513., Cl. 277-96.100.

Fukushima, Naoto; Hidaka, Kunihiko; and Iwata, Kazuroh, to Nissan Motor Co., Ltd. Shock absorber with pressure-relief mechanism. 4,407,397., Cl. 188-282.000.

Fung, Steven: *See—*
Sestanj, Kazimir; Fung, Steven; Abraham, Nedumparambil A.; and Bellini, Francesco, 4,408,077., Cl. 568-441.000.

Furlong, Owen D.; and Moore, Leonard, to Normalair-Garrett (Holdings) Limited. Flueric partial pressure sensors. 4,407,153., Cl. 73-23.000.

Furness, John A.; and Haggerty, John, to Butterworth Systems Inc. Sludge removal machine. 4,407,678., Cl. 134-167.00R.

Furuhashi, Kenshi: *See—*
Iwata, Masayosi; Furuhashi, Kenshi; and Ito, Hiroyasu, 4,408,104., Cl. 200-61.540.

Furukawa, Kenji: *See—*
Takishita, Takashi; Sutoh, Shinji; Tanaka, Noriyuki; Kobayashi, Takashi; and Furukawa, Kenji, 4,407,354., Cl. 165-42.000.

Furuta, Kenji, to Olympus Optical Co., Ltd. Recording apparatus with automatic actuator. 4,408,234., Cl. 360-69.000.

Furutachi, Nobuo: *See—*
Ichijima, Seiji; Watanabe, Toshiyuki; Furutachi, Nobuo; and Seto, Nobuo, 4,407,936., Cl. 430-505.000.

Furuya, Setsuko; Ohnishi, Shunji; and Kato, Masao, to Agnency of Industrial Science and Technology; and Ministry of International Trade and Industry. Poly-2(-2'-thiazolyl containing azo)-5-maleimide benzoic acid chelate polymer. 4,408,012., Cl. 525-161.000.

Fushiki, Takeshi; Tagawa, Tohru; and Kawakami, Satoru, to Mitsubishi Chemical Industries Ltd. Water repellent adhesive composition for wooden material. 4,407,999., Cl. 524-276.000.

G. D. Searle & Co.: *See—*
Mazur, Robert H.; Tyner, David A.; and Hallinan, Eleanor A., 4,407,746., Cl. 260-112.50E.

G. O. Stumpf GmbH & Co.: *See—*
Buss, Albert, 4,407,439., Cl. 226-20.000.

Gabel, Jonathan. Method and apparatus for high efficiency operation of electromechanical energy conversion devices. 4,408,147., Cl. 318-493.000.

Gachot, Jean. Butterfly valve. 4,407,483., Cl. 251-287.000.

Gaffal, Karl: *See—*
Schneider, Wolfangang; Peters, Josef; and Gaffal, Karl, 4,407,631., Cl. 415-122.00R.

Gagliani, John; and Long, John V. Closed cell polyimide foams and methods of making same. 4,407,980., Cl. 521-99.000.

Gaiardo, Mario: *See—*
Adamoli, Contardo; Bernardis, Francesco; Cretaz, Franco; and Gaiardo, Mario, 4,407,591., Cl. 400-124.000.

Gaisch, Helmut; Ghiste, Patrick D. L.; and Schulthess, Dieter, to Fabriques de Tabac Reunies, S.A. Process for the preparation of tobacco and tobacco prepared according to this process. 4,407,307., Cl. 131-308.000.

Galatha, Matthew J., to International Business Machines Corporation. Code format for bank check identification. 4,408,121., Cl. 235-494.000.

Gall, Martin, to Upjohn Company, The. Substituted piperazinyl-1,2,4-triazoles. 4,408,049., Cl. 544-360.000.

Gallagher Electronics Limited: *See—*
Standing, Colin A., 4,407,485., Cl. 256-10.000.

Galow, Manfred: *See—*
Flockenhaus, Claus; Wagener, Dietrich; Hackler, Erich; Smieskol, Stefan; Galow, Manfred; Meckel, Joachim; and Breidenbach, Dieter, 4,407,699., Cl. 201-39.000.

Galy, Henry: *See—*
Blanc, Claude; Galy, Henry; and Elgue, Jean, 4,407,784., Cl. 423-228.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Hoppe, Joachim, 4,407,525., Cl. 283-110.000.

Garbarino, Paul L.: *See—*
Fatula, Joseph J., Jr.; Garbarino, Paul L.; and Shepard, Joseph F., 4,407,058., Cl. 29-571.000.

Garcia, Rodrigo A.; Moreno, Roel; and Martinovich, Robert J., to Phillips Petroleum Company. Foamable polymeric composition comprising propylene polymer and hydrated alumina. 4,407,768., Cl. 264-54.000.

Gardner, Beth A.: *See—*
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,408,053., Cl. 546-226.000.
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,408,054., Cl. 546-226.000.

Garner, Derek H.; Price, Frank C.; Reader, Philip; Whittingham, David W.; White, Anthony M.; Shutt, Joseph A.; and Campling, Nicholas J., to USM Corporation. Combination toe and side lasting machine. 4,407,033., Cl. 12-10.100.

Garner, James K., Jr.: *See—*
Eatwell, William D.; and Garner, James K., Jr., 4,408,092., Cl. 174-88.00R.

Garnsworthy, Russell K. Joining of yarns by splicing. 4,407,117., Cl. 57-22.000.

Garscadden, Alan; Bailey, William F.; and Duke, Gary L., to United States of America, Air Force. Production of negative ions of hydrogen. 4,407,705., Cl. 204-157.10H.

Garside, David, to Concool International Ltd. Storage chamber with expendable refrigeration system. 4,407,144., Cl. 62-384.000.

Gay, Michael J., to Motorola, Inc. Phase detector for television tuning systems and the like. 4,408,222., Cl. 358-24.000.

Gaymans, Reinoud J.; and Bour, Edmond H. J. P., to Stamicarbon BV. Preparation of polytetramethylene adipamide. 4,408,036., Cl. 528-335.000.

Gehrke, Russell P., to American Can Company. Sterilizable flexible packaging structure. 4,407,874., Cl. 428-35.000.

Geller, William L.: *See—*
Cooperman, Michael; and Geller, William L., 4,408,133., Cl. 307-362.000.

General Electric Company: *See—*
Anderson, Thomas E.; Bush, Alvin A.; and Giorgis, John, Jr., 4,408,270., Cl. 363-132.000.
Cooper, Stephen M.; Shafer, Sheldon J.; and Tyrell, John A., 4,407,996., Cl. 524-167.000.
Cote, Paul T., 4,408,154., Cl. 323-340.000.
Crivello, James V., 4,407,759., Cl. 260-440.000.
Flock, John W.; and Matson, Stephen L., 4,408,040., Cl. 528-500.000.
Hooke, John W., 4,407,911., Cl. 429-94.000.
Howell, Edward K., 4,408,186., Cl. 340-310.00A.
Imam, Imdad, 4,408,294., Cl. 364-508.000.
Lee, Garland G., 4,408,000., Cl. 524-315.000.
Lee, Minyoung; and Szala, Lawrence E., 4,407,968., Cl. 501-87.000.
Li, Ming K., 4,408,087., Cl. 568-724.000.
Mahony, John E., 4,408,228., Cl. 358-167.000.
Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., 4,407,885., Cl. 428-246.000.
Peters, Philip H.; and Itani, Abdallah M., 4,408,268., Cl. 363-62.000.
Rampel, Guy, 4,407,913., Cl. 429-137.000.
Seymour, Raymond K.; and Doughty, Dennis J., 4,408,174., Cl. 335-20.000.
Terry, Vincent G., Jr., 4,407,602., Cl. 403-336.000.

General Foods Limited: *See—*
Holley, Edward J., 4,407,837., Cl. 426-578.000.

General Mining Union Corporation Limited: *See—*
Bohme, Rolf C.; and Lazerson, Max M., 4,407,415., Cl. 209-556.000.

General Motors Corporation: *See—*
Benton, Robert L.; Martinsons, Dainis O.; and Stimpson, Flave F., 4,407,511., Cl. 277-24.000.
Landenberger, Ulric, 4,407,162., Cl. 73-527.000.
Lindbert, Brook A., 4,407,387., Cl. 180-247.000.
Schramme, Stephan H.; and Kelley, Mark A., 4,407,042., Cl. 16-2.000.
Sundeen, Arthur R., 4,407,155., Cl. 73-116.000.
Thompson, Ricky D., 4,408,140., Cl. 310-234.000.

General Railway Signal Company: *See—*
Davila, Jose E.; and Gomez, Jim H., 4,407,312., Cl. 133-8.00R.

General Tire & Rubber Company, The: *See—*
Budzowski, Ronald L., 4,407,684., Cl. 156-133.000.

Genske, Roger P.: *See—*
Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,407,873., Cl. 428-35.000.

George, Henry C.: *See—*
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Georgian Manufacturing Ltd.: *See—*
Millen, Theodore I., 4,408,193., Cl. 340-566.000.

Gerber, Donald J., to Koppers Company, Inc. High efficiency coke oven regenerator checker brick. 4,407,352., Cl. 165-9.100.

Gerkin, Richard M., to Union Carbide Corporation. Polyoxamate polymer/polyols. 4,407,983., Cl. 521-128.000.

Gershnow, Abraham H., to Digital Equipment Corporation. Color printing apparatus. 4,407,595., Cl. 400-212.000.

Gesellschaft fur Biotechnologische Forschung mbH (GBF): *See—*
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; Bischoff, Ludwig; Penkert, Rosemarie; and Siefert, Eicke, 4,407,947., Cl. 435-85.000.

Ghiste, Patrick D. L.: *See—*
Gaisch, Helmut; Ghiste, Patrick D. L.; and Schulthess, Dieter, 4,407,307., Cl. 131-308.000.

Gibbs, Ronald L.: *See—*
Shipley, Randall S.; Lowery, Kirby, Jr.; and Gibbs, Ronald L., 4,408,025., Cl. 526-119.000.

Gibson, Donald C.: *See—*
Shepherd, Ian C.; Pearson, Ian G.; and Gibson, Donald C., 4,407,112., Cl. 56-13.400.

Giebeler, James F., to Arrowhead Continental. High pressure swivel joint. 4,407,533., Cl. 285-281.000.

Giertz, Franz: *See—*
Bonn, Berhard; Giertz, Franz; Holl, Lothar; and Schreckenberg, Heinz, 4,407,355., Cl. 165-104.160.

Gilcher, Heinz, to American Standard Inc. Code reset apparatus for railroad track circuits. 4,407,470., Cl. 246-34.00R.

Gillette Company, The: *See—*
Trotta, Robert A., 4,407,067., Cl. 30-50.000.

Gillingham, Ronald D.: *See—*
Bushaw, Kenneth A.; Gillingham, Ronald D.; Jorgenson, Gary W.; Manning, Clyde L.; and Steffes, Michael A., 4,408,231., Cl. 358-280.000.

Gillis, Steven, to Immunex Corporation. Constitutive production of interleukin 2 by a T cell hybridoma. 4,407,945., Cl. 435-68.000.

Gilovich, Paul A.; and Toreson, James S., to Microcomputer Systems, Inc. Magnetic tape apparatus. 4,408,317., Cl. 360-74.300.

Ginder, William F., to Ad-Pro Industries, Inc. Method of removing water from ethanol. 4,407,662., Cl. 55-33.000.

Ginter, Sally P.; and Hamlin, Percy J., to Dow Chemical Company, The. Degeneration inhibited sanitizing complexes. 4,408,001., Cl. 524-376.000.

Gintis, Daniel; and Most, Elmer E., Jr., to Du Pont de Nemours, E. I., and Company. Splittable hollow polyester filament. 4,407,889., Cl. 428-398.000.

Giorgis, John, Jr.: *See—*
Anderson, Thomas E.; Bush, Alvin A.; and Giorgis, John, Jr., 4,408,270., Cl. 363-132.000.

Gladman, Terence; and Ballinger, Nicholas K., to British Steel Corporation. Dual-phase steels. 4,407,680., Cl. 148-12.00F.

Glasscock, Gus: *See—*
Brune, Arlen G.; and Schmidt, Nelson, 4,407,111., Cl. 56-16.400.

Global Integration Technologies, Inc.: *See*—
White, Douglass A.; Moore, Susan J.; and Clark, David F., 4,408,199., Cl. 340-731.000.

Godat, Jean: *See*—
Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,407,584., Cl. 366-279.000.

Godtfredsen, Wagn O.; and von Daehne, Welf, to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab). Processes for preparing β-lactams. 4,407,751., Cl. 260-239.100.

Goebel, Franz, to GTE Products Corporation. Method for internally discharging an electrochemical cell. 4,407,909., Cl. 429-50.000.

Goeft, Manfred: *See*—
Dziuba, Peter; and Goeft, Manfred, 4,407,382., Cl. 180-10.000.

Goldin, Morris: *See*—
Emigh, Charles F.; and Goldin, Morris, 4,407,467., Cl. 244-17.110.

Goldsmith, Aaron. Cleaning system having improved cleaning solution recovery. 4,407,041., Cl. 15-321.000.

Goletto, Jean: *See*—
Pusineri, Christian; and Goletto, Jean, 4,408,026., Cl. 525-128.000.

Gomez, Jim H.: *See*—
Davila, Jose E.; and Gomez, Jim H., 4,407,312., Cl. 133-8.00R.

Goodley, Paul H. Cervical traction device. 4,407,274., Cl. 128-69.000.

Goodman, Howard M.; Shine, John; and Seeburg, Peter H., to University of California, The Regents of the. Purification of nucleotide sequences suitable for expression in bacteria. 4,407,948., Cl. 435-91.000.

Goodman, Joseph J.: *See*—
Labeda, David P.; Martin, John H. E. J.; and Goodman, Joseph J., 4,407,946., Cl. 435-75.000.

Goodyear Tire & Rubber Company, The: *See*—
Pengilly, Brian W., 4,408,004., Cl. 524-398.000.

Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, to Chemische Fabrik Stockhausen & Cie. Process for preparation of α, β-unsaturated N-substituted-carboxylic acid amides. 4,408,073., Cl. 564-204.000.

Gorbacheva, Irina N.; Kozinda, Zinaida J.; Suvorova, Elena G.; Chertov, Viktor A.; Dvoskin, Semen I.; Platonova, Evdokia V.; Podgaevskaya, Tatyana A.; and Skvirenko, Andrei B., to Tsentralny Nauchno-Issledovatelsky Institut. Azo dyestuffs possessing antimicrobial properties. 4,407,748., Cl. 260-153.000.

Gossage, John R. Recreational table. 4,407,475., Cl. 248-156.000.

Goto, Jiro: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Nakai, Yoshiharu; Sakane, Kazuo; and Goto, Jiro, 4,407,798., Cl. 424-246.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,408,042., Cl. 544-22.000.

Gottlieb, Klaus; and Graf, Wilfried, to VEBA OEL AG. Process for preparing sec-butyl alcohol and sec-butyl tert-butyl ether. 4,408,085., Cl. 568-697.000.

Gould, Francis E.; and Johnston, Christian W., to Tyndale Plains-Hunter, Ltd. Polyurethane diacrylate compositions useful for contact lenses and the like. 4,408,023., Cl. 525-454.000.

Gould, Herbert J., to International Rectifier Corporation. Schottky device and method of manufacture using palladium and platinum intermetallic alloys and titanium barrier for low reverse leakage over wide temperature range. 4,408,216., Cl. 357-15.000.

Gouzy, Andre: *See*—
Berger, Raymond; de Cachard, Maurice B.; Collet, Alain; Costes, Didier; Gouzy, Andre; Dupuy, Guy; Caunes, Pierre; and Chevrier, Claude, 4,407,359., Cl. 165-167.000.

Grabbe, Dimitry G., to AMP Incorporated. Ceramic chip carrier with lead frame having removable rim. 4,408,218., Cl. 357-70.000.

Grabowski, John S.; Shiau, Chin-Chih; and Latala, John R., to NCR Corporation. Method for recognizing a machine encoded character. 4,408,342., Cl. 382-9.000.

Gracie, Geysa. Weighted exercise suit. 4,407,497., Cl. 272-119.000.

Gradassi, Michael J.: *See*—
Pellet, Regis J.; Gradassi, Michael J.; and Bertolacini, Ralph J., 4,407,736., Cl. 502-230.000.

Graetz, Herbert; and Unterreiner, Ronald C., to Blair Industries, Inc. Book type cassette holder and method of making same. 4,407,410., Cl. 206-387.000.

Graf, Harlan G.: *See*—
Davis, Richard L.; Graf, Harlan G.; Edwards, Don L.; and Macbeth, William B., Jr., 4,407,700., Cl. 202-85.000.

Graf, Wilfried: *See*—
Gottlieb, Klaus; and Graf, Wilfried, 4,408,085., Cl. 568-697.000.

Graham, Donald W.; Rasmusson, Gary H.; and Tolman, Richard L., to Merck & Co., Inc. 6-Amidino-9-substituted benzyl purines. 4,407,802., Cl. 424-253.000.

Graham, Douglas I. Tool for rotating threaded fasteners. 4,407,175., Cl. 81-57.390.

Graham, John M. Air service brake exhaust control system. 4,407,548., Cl. 303-6.00M.

Gram S.A.: *See*—
Beck, Rene A., 4,407,106., Cl. 52-722.000.

Graves, Alan F.: *See*—
Betts, Malcolm C.; Graves, Alan F.; Pascoe, Frederick M.; and Dilley, James E., 4,408,189., Cl. 340-347.0DD.

Gray, Stanley J. Multiple sheath cable and method of manufacture. 4,407,065., Cl. 29-828.000.

Greenler, Robert J. Adjustable seal for glass sheet furnace. 4,407,650., Cl. 432-242.000.

Greenway, Peter R.; Sulowski, Andrew C.; and George, Henry C. Pole climber's safety device. 4,407,391., Cl. 182-9.000.

Grees, Lennart: *See*—
Adlerteg, Bo; and Grees, Lennart, 4,408,173., Cl. 335-16.000.

Grier, Dale C.: *See*—
Reynolds, Francis D., 4,407,283., Cl. 128-218.00F.

Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., to TRW Inc. Aircraft propeller assembly with composite blades. 4,407,635., Cl. 416-230.000.

Grimm, Hermann: *See*—
Koukal, Heinz; and Grimm, Hermann, 4,407,167., Cl. 74-501.00R.

Griss, Peter: *See*—
Heimke, Gunther; and Griss, Peter, 4,407,022., Cl. 3-1.913.

Grobman, Warren D., to International Business Machines Corporation. Pulsed electromagnetic radiation source having a barrier for discharged debris. 4,408,338., Cl. 378-034.000.

Grodkiewicz, William H.; Singh, Shobha; and Van Uitert, LeGrand G., to Bell Telephone Laboratories, Incorporated. Fabrication procedure using arsenate glasses. 4,407,061., Cl. 29-576.00B.

Groen, Marinus B., to Akzo N.V. 8α-Oestra-1,3,5(10)-triene derivatives, processes for their preparation and pharmaceutical compositions. 4,407,753., Cl. 260-239.55R.

Gronbech, Robert W., to Davey-Loewy Limited. Rolling mill. 4,407,151., Cl. 72-241.000.

Grover, Wayne D., to Northern Telecom Limited. Transmitting additional signals using violations of a redundant code used for transmitting digital signals. 4,408,325., Cl. 370-119.000.

Grozinger, Gerhard; Schindler, Hartmut; and Schmid, Franz, to Sipra Patententwicklungs Beteiligungsgesellschaft mbH. Control network for use in knitting machines and the like. 4,408,118., Cl. 377-2.000.

Grushkin, Bernard; and Bertrand, Jacques C., to Xerox Corporation. Pressure sensitive toner compositions. 4,407,922., Cl. 430-98.000.

GTE Laboratories Incorporated: *See*—
Briere, Alfred D., 4,407,666., Cl. 65-2.000.
Byszewski, Wojciech W.; Budinger, A. Bowman; and Proud, Joseph M., 4,408,141., Cl. 315-56.000.
Cooperman, Michael; and Geller, William L., 4,408,133., Cl. 307-362.000.

GTE Products Corporation: *See*—
Goebel, Franz, 4,407,909., Cl. 429-50.000.

Gubin, Petr V.: *See*—
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.

Gueret, Jean-Louis H., to L'Oreal. Make-up unit with an adjustable wiper device. 4,407,311., Cl. 132-88.500.

Gulf Research & Development Co.: *See*—
Kehl, William L., 4,407,730., Cl. 502-208.000.
Kehl, William L., 4,407,732., Cl. 502-208.000.

Gulf & Western Manufacturing Company: *See*—
Muzzell, Stephen E., 4,407,492., Cl. 267-103.000.

Gunesin, Binnur, to Firestone Tire & Rubber Company, The. Method for blending plastic and rubber phase latices and improving impact properties of plastics. 4,408,014., Cl. 525-218.000.

Gunter, James C., to Robertshaw Controls Company. Apparatus and method for forming an electrical switch assembly or the like. 4,407,066., Cl. 29-882.000.

Gunzberg, Guy W.; and Lippman, Lawrence G., to M. Wile & Company, Inc. Point-of-manufacture data acquisition system. 4,408,291., Cl. 364-900.000.

Gutbier, Heinrich; Strasser, Karl; Limberg, Elmar; and Jensen, Volker, to Siemens Aktiengesellschaft; and Ingenieurkontor Lubeck. Electric dc source. 4,407,903., Cl. 429-23.000.

Guterman, Daniel C.; and Kupec, James D., to Mostek Corporation. Directly-coupled and capacitively coupled nonvolatile static RAM cell. 4,408,303., Cl. 365-205.000.

Guth, Richard U. Breath test simulator and method. 4,407,152., Cl. 73-1.00G.

H-C Industries, Inc.: *See*—
Wilde, Sheldon L.; McCandless, Thomas J.; and Saunders, Robert M., 4,407,422., Cl. 215-246.000.

Haardt, Henry; Magdon, John; and Noble, Eric, to National Patent Development Corporation. Molds and procedure for producing truncated contact lenses. 4,407,766., Cl. 264-2.200.

Haarmann & Reimer GmbH: *See*—
Kopsel, Manfred; and Emberger, Roland, 4,407,740., Cl. 252-522.00R.

Haas, Laird K. S.; Herring, Larry H.; and Nakada, Yoshinao, to Bell Telephone Laboratories, Incorporated. Process for improving electrode coatings. 4,407,849., Cl. 427-37.000.

Haase, Gerald A. Magnetic sweeper. 4,407,038., Cl. 15-105.000.

Haberer, Merle D. Apparatus for cleaning interior of a milk tank. 4,407,315., Cl. 134-58.00R.

Hackler, Erich: *See*—
Flockenhaus, Claus; Wagener, Dietrich; Hackler, Erich; Smieskol, Stefan; Galow, Manfred; Meckel, Joachim; and Breidenbach, Dieter, 4,407,699., Cl. 201-39.000.
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,407,974., Cl. 518-711.000.

Haftmann, Johannes, to Nixdorf Computer AG. Arrangement for monitoring the operation of the ink ribbon of an ink-ribbon magazine. 4,407,593., Cl. 400-208.000.

Hageniers, Omer L.: *See*—
Pryor, Timothy R.; and Hageniers, Omer L., 4,407,379., Cl. 177-52.000.

Haggerty, John: *See*—
Furness, John A.; and Haggerty, John, 4,407,678., Cl. 134-167.00R.

Hagihara, Bunji; Fukai, Tamotsu; Nomura, Kikuo; Yoshida, Kenichi; and Isshiki, Isao, to Sumitomo Electric Industries Ltd.; and Hagihara, Bunji, part interest to each. Transcutaneous blood oxygen measuring device. 4,407,291., Cl. 128-635.000.

Hagopian, Arpi: *See*—
Kniskern, Peter J.; Hagopian, Arpi; and Carlo, Dennis J., 4,407,949., Cl. 435-101.000.

Haigh, Harry; and Sonmor, Rudy C., to R.C.S. Enterprises Limited. Gear pump having an isolator to protect its bearings. 4,407,645., Cl. 418-131.000.

Haines, Roger W.; and Purinton, Mark A., to Borg-Warner Corporation. Return air flow control for variable air volume system. 4,407,185., Cl. 98-1.500.

Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 4,408,224., Cl. 358-108.000.

Halbach & Braun: *See*—
Braun, Ernst; and Braun, Gert, 4,407,546., Cl. 299-34.000.

Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,407,726., Cl. 502-161.000.

Hall, David A.; and Olson, George P., to International Business Machines Corporation. Solenoid impact print hammer with uniform free flight time. 4,407,193., Cl. 101-93.010.

Hall, Derrard M.; Kemp, Roy A.; and Such, Christopher H., to ICI Australia Limited. Acrylic coating compositions. 4,407,990., Cl. 524-38.000.

Hall & Kay Engineering Limited: *See*—
O'Reilly, Kevin G., 4,407,142., Cl. 62-238.600.

Halliburton Company: *See*—
de Kanter, Scipio, 4,407,136., Cl. 62-64.000.

Hallinan, Eleanor A.: *See*—
Mazur, Robert H.; Tyner, David A.; and Hallinan, Eleanor A., 4,407,746., Cl. 260-112.50E.

Halls, Lawrence M.: *See*—
McIlwain, Irwin D.; and Halls, Lawrence M., 4,407,110., Cl. 56-14.400.

Ham, George E.: *See*—
Bertram, James L.; Ham, George E.; and Chen, Wuu-Nan, 4,408,062., Cl. 549-517.000.

Hamada, Toshiyoshi: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,407,959., Cl. 435-288.000.

Hamlin, Percy J.: *See*—
Ginter, Sally P.; and Hamlin, Percy J., 4,408,001., Cl. 524-376.000.

Hammonds, James C.; and VanDyke, Ronald D., to ACF Industries, Incorporated. Combination manual and automatic unlocking mechanism for trailer hitch head. 4,407,617., Cl. 410-59.000.

Hamrick, Joseph T., to Well-Pack Systems, Inc. Borehole water pumping system with sandtrap. 4,407,360., Cl. 166-68.000.

Han, Yu-Pin; and Ma, Bing C., to Mostek Corporation. Fabrication of isolation oxidation for MOS circuit. 4,407,696., Cl. 156-653.000.

Haneda, Hideo: *See*—
Yamanaka, Minoru; Suzuki, Mitsuyuki; Haneda, Hideo; Kato, Masatoshi; and Ohtsuki, Masataka, 4,407,448., Cl. 236-88.000.

Hanke, Leopold; Hellebrand, Hans; and Schmelz, Helmut, to Siemens Aktiengesellschaft. Method for producing films of sintered polycrystalline silicon. 4,407,858., Cl. 427-86.000.

Hankland, Lawrence B., to Ford Aerospace & Communication Corporation. Metallized film transfer process. 4,407,685., Cl. 156-212.000.

Hans Grohe GmbH & Co. KG: *See*—
Buzzi, Gunter, 4,407,890., Cl. 428-408.000.

Hansen, Erik, to ESAB Aktiebolag. Self-adjusting turning roll assembly. 4,407,621., Cl. 414-433.000.

Hanson, Charles B., to J. I. Case Company. Bucket tooth attachment means. 4,407,081., Cl. 37-141.00T.

Hanson, Lloyd D.; and Purton, Robert M., to Dresser Industries, Inc. Flow control valve. 4,407,327., Cl. 137-625.300.

Hanssen, Tore B.; and Zwirek, Chester S., to Singer Company, The. Thermostatic switch. 4,408,178., Cl. 337-320.000.

Hara, Koichi: *See*—
Nomura, Manabu; Sugi, Norio; Tanaka, Takayoshi; and Hara, Koichi, 4,407,986., Cl. 523-200.000.

Hara, Masahiro; Sakai, Toshiyasu; and Okamoto, Atsutoshi, to Nippondenso Co., Ltd. Bar code scanner. 4,408,120., Cl. 235-462.000.

Hara, Tomihiro; Ogawa, Masahiro; Yamashita, Masaaki; and Tajiri, Yasuhisa, to Nippon Kokan Kabushiki Kaisha. Surface treated steel sheets for paint coating. 4,407,899., Cl. 428-626.000.

Harada, Kunihiro: *See*—
Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, 4,407,927., Cl. 430-197.000.

Harada, Shozo; Ito, Kazuo; Shirai, Takayuki; and Koide, Tetsuya, to Ina Seito Co., Ltd. Method of manufacturing cement products having superior mechanical strength. 4,407,769., Cl. 264-60.000.

Harada, Takamasa, to Kabushiki Kaisha Daini Seikosha. Electro-optic display device using phase transition mode liquid crystal. 4,408,201., Cl. 340-784.000.

Harbin, Wayne D.; Stark, Marvin; and Britt, Kenneth W., to Richmond Tank Car Company. Railroad tank car lift lug. 4,407,203., Cl. 105-462.000.

Hardman, Charles A.; and Burns, Orville M., Jr. Bowling ball weighing and balancing device. 4,407,154., Cl. 73-66.000.

Hardman, Harley F.: *See*—
Pedersen, S. Erik; Hardman, Harley F.; and Wagner, Louis F., 4,408,071., Cl. 562-536.000.

Hardy, Rex F. G.: *See*—
Hines, Howard E.; Hardy, Rex F. G.; and Butler, David S., 4,407,337., Cl. 140-124.000.

Hardy, Thomas A., to Stauffer Chemical Company. Synthesis of organic phosphate-phosphonates. 4,407,765., Cl. 260-970.000.

Harford, Jack R., to RCA Corporation. Noise sensitivity reduction apparatus for a TV receiver AGC system. 4,408,229., Cl. 358-177.000.

Harita, Yoshiyuki: *See*—
Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, 4,407,927., Cl. 430-197.000.

Harlamert, W. Benjamin: *See*—
Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., 4,407,635., Cl. 416-230.000.

Harmon, James V. Dispenser for pouring measured quantities of a liquid from a container. 4,407,435., Cl. 222-481.000.

Harris, James J.; and Hostetler, Donald E., to Atlantic Richfield Company. Method of supporting a catalyst on polyolefins. 4,407,727., Cl. 502-115.000.

Harris, Ralph A., to Texas Instruments Incorporated. Optical transmission of digital seismic data. 4,408,307., Cl. 367-79.000.

Hartford, Louise D.; and Kavoussi, James P. Scent-awake clock. 4,407,585., Cl. 368-12.000.

Hartgrave, Jimmy D. Animated figure amusement device. 4,407,083., Cl. 40-414.000.

Hartig, Norman F.: *See*—
Neill, Jimmie; Webb, Nathaniel; and Hartig, Norman F., 4,408,343., Cl. 382-52.000.

Hartl, Franz: *See*—
Domhan, Gerold; Hartl, Franz; and Vogelgsang, Kurt, 4,408,111., Cl. 200-318.000.

Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. V-Groove semiconductor light emitting devices. 4,408,331., Cl. 372-46.000.

Hartwimmer, Robert: *See*—
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Hartzell Manufacturing, Inc.: *See*—
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Hasegawa, Kaisuji, to Meinan Machinery Works, Inc. Veneer lathe with cord embedding knife. 4,407,345., Cl. 144-211.000.

Hasegawa, Shumpei: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,407,243., Cl. 123-179.00G.

Hasha, Brian B.: *See*—
Hasha, Malvern M.; and Hasha, Brian B., 4,407,171., Cl. 73-46.000.

Hasha, Malvern M.; and Hasha, Brian B. Apparatus and method for hydrostatically testing sealing face surfaces of tubular joints. 4,407,171., Cl. 73-46.000.

Hashimoto, Hitoshi: *See*—
Matsuyama, Kiyoshi; and Hashimoto, Hitoshi, 4,408,024., Cl. 526-67.000.

Hashimoto, Kazuo; and Konno, Mutsuo. Lighting and morse code signaling device. 4,408,182., Cl. 340-321.000.

Hashimoto, Nobuo: *See*—
Kondo, Takashi; and Hashimoto, Nobuo, 4,408,288., Cl. 364-525.000.

Hashimoto, Shinichi; Takano, Toshimasa; and Mukai, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Transfer device. 4,407,580., Cl. 355-3.0TR.

Hashizume, Hideyuki; and Tsuchiya, Tadashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polyvinylidene fluoride film having superior dielectric strength and a process for producing the same. 4,407,887., Cl. 428-332.000.

Haskel Engineering & Supply Company: *See*—
Kelly, John W., 4,407,150., Cl. 72-61.000.

Hasselmann, William J. Weapon. 4,407,086., Cl. 42-90.000.

Hata, Kazuhiko: *See*—
Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, 4,408,086., Cl. 568-719.000.

Hata, Shuntaro: *See*—
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Hatanaka, Masataka: *See*—
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Hauser, Hanspeter; and Eckert, Peter, to Ciba-Geigy Corporation. Printing ink compositions and use thereof for the production of textured foamed resin materials. 4,407,882., Cl. 428-159.000.

Hausler, Frederick A., to ACF Industries, Incorporated. Wellhead casing packing support. 4,407,514., Cl. 277-117.000.

Haviv, Fortuna; and Denet, Robert W., to Abbott Laboratories. Antiinflammatory 1-(quinolinyl)-2-pyrazoline derivatives. 4,407,803., Cl. 424-258.000.

Hawkins, James B.: *See*—
Van Doorn, Donald W.; Webb, Tommy W.; and Hawkins, James B., 4,407,047., Cl. 19-64.500.

Hawley, Clyde W., to Dollinger Corporation. Modular spin filters and housing therefor. 4,407,663., Cl. 55-347.000.

Hayasaka, Toshimi, to Olympus Optical Company Ltd. Specimen holding device for microscope stages. 4,407,570., Cl. 350-529.000.

Hayashi, Hideki: *See*—
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Hayes, Derek. Electrical coupling device. 4,407,557., Cl. 339-97.00R.
Hayes, Richmond S., Jr., to Carrier Corporation. Fast defrost heat exchanger. 4,407,137., Cl. 62-80.000.
Haynes, Gardner: *See*—
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Hearn, Anthony R., to International Business Machines Corporation. Magnetic head arm assembly. 4,408,238., Cl. 360-104.000.
Heath Company: *See*—
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Heden, Carl G. Method of regulating radiation through windows. 4,407,267., Cl. 126-419.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Polyurethanes prepared from polyisocyanate, polyol and phosphonopolyester oligomers. 4,408,033., Cl. 528-72.000.
Heiberger, Francis E.: *See*—
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Heimke, Gunther; and Griss, Peter, to Friedrichsfeld GmbH, Steinzeug- und Kunststoffwerke. Femur component for an artificial hip joint. 4,407,022., Cl. 3-1.913.
Hekal, Ihab M., to Continental Group, Inc., The. Cap for and in combination with a container. 4,407,429., Cl. 220-359.000.
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Hanke, Leopold; Hellebrand, Hans; and Schmelz, Helmut, 4,407,858., Cl. 427-86.000.
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Henkel Kommanditgesellschaft auf Aktien: *See*—
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Hennessy, Arnold; and Inch, John D. Water-conserving toilet. 4,407,025., Cl. 4-321.000.
Henrich, Werner. Apparatus or stranding wire. 4,407,116., Cl. 57-13.000.
Henshaw, William F.; White, John R.; and Niiler, Andrus, to United States of America, Army. Hollow cathode discharge source of metal vapor. 4,407,712., Cl. 204-298.000.
Herbermann, Gottfried: *See*—
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Hercules Incorporated: *See*—
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Blunt, Harry W., 4,408,019., Cl. 525-323.000.
Hergeth, Incorporated: *See*—
Smith, George F., Jr., 4,407,107., Cl. 53-528.000.
Herpers, Lodewijk-Jozef, to Medtronic, Inc. Atrial and ventricular-only pacemaker responsive to premature ventricular contractions. 4,407,287., Cl. 28-419.0PG.
Herring, Larry H.: *See*—
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Hettwer, Paul F.: *See*—
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Heyn, William M., to Continental Group, Inc., The. Plastic plug type closure for beverage containers. 4,407,424., Cl. 220-269.000.
Heyser, Gregory L. Boat trailer tongue extender. 4,407,519., Cl. 280-482.000.
Hibbitts, Charles H., to American Brands, Inc. Method for expanding tobacco with steam at high temperature and velocity. 4,407,306., Cl. 131-296.000.
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Hiestand, Peter; and Strasser, Michael, to Sandoz Ltd. Novel bis- and poly-disulfides having immunostimulant activity. 4,407,825., Cl. 424-336.000.
Higashiyama, Hirokichi: *See*—
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Hilton, Carl W.; and Bullard, Harold L., to Return on Investment Corporation. Cruise control modulator. 4,407,385., Cl. 180-175.000.
Hines, Howard E.; Hardy, Rex F. G.; and Butler, David S., to Post Office. Wire wrapping tool for wrapping insulated wire. 4,407,337., Cl. 140-124.000.
Hinesley, Carl P.: *See*—
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Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, to Sandoz Ltd. Hindered piperidine polymer stabilizers. 4,407,993., Cl. 524-96.000.
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, to Sandoz Ltd. 1-Oxa-3,8-diazaspiro[4.5]decanes. 4,408,051., Cl. 546-19.000.
Hinze, William W., to Collins Industries, Inc. Wheelchair lock for reducing wheel spoke interference. 4,407,616., Cl. 410-3.000.
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Hisatake, Yoshihiko: *See*—
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Hitachi Chemical Company, Ltd.: *See*—
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Uozumi, Norihira; Yamagata, Takeo; Yasukawa, Saburo; Tsutsumi, Yasuyuki; and Ono, Seiichiro, 4,407,904., Cl. 429-26.000.
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Hocker, Jurgen; Wieder, Wolfgang; and Dhein, Rolf, to Bayer Aktiengesellschaft. Foils of polyacetylene. 4,408,027., Cl. 526-185.000.
Hockham, George A., to International Telephone and Telegraph Corporation. Multiple beam antenna feed arrangement for generating an arbitrary number of independent steerable nulls. 4,408,205., Cl. 343-16.00R.
Hodges, Bonnie E. Pipe hanger. 4,407,478., Cl. 248-542.000.
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Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., 4,408,054., Cl. 546-226.000.
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Hofer, Franz, to U.S. Philips Corporation. Gettering device and method. 4,407,656., Cl. 445-10.000.
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Hofmann, Ulrich. Racket handle. 4,407,500., Cl. 273-75.000.
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Hohl, Gregory D. Coulter attachment for seed planting apparatus. 4,407,371., Cl. 172-253.000.
Hohmann, Walter; and Stawitz, Josef, to Bayer Aktiengesellschaft. Anthraquinone vat dyestuffs. 4,408,056., Cl. 548-416.000.
Holl, Lothar: *See*—
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Holman, James L., Jr.; McIlwain, John F.; and Neumeier, L. A., to United States of America, Interior. Pressureless consolidation of metallic powders. 4,407,775., Cl. 419-36.000.
Holston, Roger W.; and Hinesley, Carl P., to Emerson Electric Co. Speed control system and method for electric motor. 4,408,150., Cl. 318-779.000.
Holtman, Richard K.: *See*—
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Holtschmidt, Ulrich; Koerner, Gotz; Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, to T. Goldschmidt AG. Process for the preparation of heat-curable silicone resins usable especially as electrical insulating resins. 4,408,031., Cl. 528-26.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Sikorski, James A.; and Hoobler, Mary A., 4,407,764., Cl. 260-940.000.
Hooke, John W., to General Electric Company. Rechargeable electrochemical cell pack having resistance to impact and vibration. 4,407,911., Cl. 429-94.000.
Hoppe, Joachim, to GAO Gesellschaft fur Automation und Organisation mbH. Identification card with hallmark for authentication by incident and transmitted light. 4,407,525., Cl. 283-110.000.
Hopper, Thomas P., to Sunsearch, Inc. Solar energy collector system having balanced heat-exchange fluid flow. 4,407,269., Cl. 126-442.000.
Horbelt, Michael; Arnold, Herbert; and Winkelmann, Lothar, to Robert Bosch GmbH. Air flow rate measuring device in an internal combustion engine. 4,407,156., Cl. 73-118.000.
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Horigome, Shinkichi: *See*—
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Horney, Robert W. Air control device. 4,407,187., Cl. 98-41.0SV.
Hoschett, Albert M., to Teletype Corporation. Retaining clip for an electrical connector. 4,407,556., Cl. 339-91.00R.
Hoskins, Paul T., Jr., to Southern Railway Company. Thin flange and loose wheel detection system. 4,407,072., Cl. 33-203.110.
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Hotimsky, Eric R. Device for mounting and balancing the rotary knives of a cutter machine. 4,407,458., Cl. 241-282.100.
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Howard, James K.: *See*—
Chu, Wei-Kan; and Howard, James K., 4,408,254., Cl. 361-321.000.
Howe, Milton A., Jr., to W. R. Grace & Co. Bag dispenser. 4,407,473., Cl. 248-95.000.
Howell, Edward K., to General Electric Co. Power line communication over ground and neutral conductors of plural residential branch circuits. 4,408,186., Cl. 340-310.00A.
Howell, Stephen H., to University of California, The Regents of the. Cloned cauliflower mosaic virus DNA as a plant vehicle. 4,407,956., Cl. 435-172.000.
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, to Takeda Chemical Industries, Ltd. Phospholipid carbamates. 4,408,052., Cl. 546-22.000.
HRI, Inc.: *See*—
Kydd, Paul H., 4,407,367., Cl. 166-267.000.
Hrovat, Milan; Huschka, Hans; and Rachor, Lothar, to Nukem GmbH. Process for conditioning radioactive and toxic wastes. 4,407,742., Cl. 252-628.000.
Hubbard, Thom W. Method and apparatus for controlling fluid currents. 4,407,608., Cl. 405-31.000.
Hubscher, Josef: *See*—
Barner, Richard; and Hubscher, Josef, 4,407,754., Cl. 260-239.55D.
Huebsch, Donald L.; and Paulos, Louis B. Magnetically operated fail-safe cutoff valve with pressure equalizing means. 4,407,329., Cl. 137-629.000.
Huelsekopf, Alfred G., to Com-Dor Supply Limited. Window frame assembly with frame shaped locking member. 4,407,100., Cl. 52-212.000.
Huff, Joseph F., to Polaroid Corporation. Photographic film assemblage. 4,407,579., Cl. 354-275.000.
Hughes Aircraft Company: *See*—
Eu, Victor K.; Feng, Milton; Zielinski, Timothy T.; and Whelan, James M., 4,407,694., Cl. 156-606.000.
Wysocki, Joseph A., 4,407,561., Cl. 350-96.300.
Hughes Helicopters, Inc.: *See*—
Emigh, Charles F.; and Goldin, Morris, 4,407,467., Cl. 244-17.110.
Hugo, Franz: *See*—
Wanetzky, Erwin; Hugo, Franz; and Kuhlmann, Fernand, 4,407,488., Cl. 266-148.000.

Hultgren, Karl S. H. Thin sheet metal heat exchanger. 4,407,357., Cl. 165-165.000.

Hummel, David M. Toy aircraft. 4,407,494., Cl. 272-1.00D.

Humpherson, Donald: *See—*
Sutcliffe, Gordon R.; Warden, Stephen J.; and Humpherson, Donald, 4,407,062., Cl. 29-599.000.

Humphrey Instruments, Inc.: *See—*
Humphrey, William E., 4,407,572., Cl. 351-212.000.

Humphrey, William E., to Humphrey Instruments, Inc. Keratometer. 4,407,572., Cl. 351-212.000.

Hundt, Eckart; and Trautenberg, Elmar, to Siemens Aktiengesellschaft. Method for processing ultrasonic echo signals of both directionally reflecting as well as non-directionally scattering objects, particularly for ultrasonic image processing in the field of substance or tissue investigation. 4,407,163., Cl. 73-607.000.

Hunkeler, Walter; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Azeto-imidazo-diazepines. 4,407,752., Cl. 260-239.30P.

Hunter, Edwin J., to Toro Company, The. Water pressure controlled indexing means for irrigation sprinkler system. 4,407,451., Cl. 239-66.000.

Huret, Alain P. B., legal representative: *See—*
Huret, Roger, deceased; and Huret, Alain P. B., legal representative, 4,407,599., Cl. 403-11.000.

Huret et ses Fils: *See—*
Huret, Roger, deceased; and Huret, Alain P. B., legal representative, 4,407,599., Cl. 403-11.000.

Huret, Roger, deceased; and by Huret, Alain P. B., legal representative, to Huret et ses Fils. Device for fixing a derailleur on a frame lug. 4,407,599., Cl. 403-11.000.

Huschka, Hans: *See—*
Hrovat, Milan; Huschka, Hans; and Rachor, Lothar, 4,407,742., Cl. 252-628.000.

Huse, Per, to O. Mustad & Son A/S. Method for attaching snells to a fishing line, and an apparatus for carrying out the method. 4,407,087., Cl. 43-4.000.

Hutchison, Stanley O.; and Anderson, Glenn W., to Chevron Research Company. Method and apparatus for placing a cement thermal packer. 4,407,369., Cl. 166-291.000.

Hutt, Peter R.: *See—*
Dean, Andrew; and Hutt, Peter R., 4,408,226., Cl. 358-139.000.

Hutter, Charles G., III. System for dispensing curable compositions. 4,407,431., Cl. 222-1.000.

Hydrotile Machinery Company: *See—*
Fosse, Navarro T., 4,407,648., Cl. 425-457.000.

Ichijima, Seiji; Watanabe, Toshiyuki; Furutachi, Nobuo; and Seto, Nobuo, to Fuji Photo Film Co., Ltd. Process and material for forming color photographic image. 4,407,936., Cl. 430-505.000.

Ichikawa, Atsushi: *See—*
Tajima, Fujio; Ichikawa, Atsushi; and Shimizu, Isao, 4,407,462., Cl. 242-184.000.

Ichikawa, Yasunori: *See—*
Sugimoto, Naohiko; Maekawa, Yukio; and Ichikawa, Yasunori, 4,407,937., Cl. 430-527.000.

Ichiyanagi, Toshikazu; Sudoh, Kanzaburo; Ogawa, Keisuke; and Yamazaki, Nobuhiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Chichibu Cement Kabushiki Kaisha. Apparatus for calcining raw materials in the form of powder or particles. 4,407,652., Cl. 432-58.000.

ICI Australia Limited: *See—*
Hall, Derrard M.; Kemp, Roy A.; and Such, Christopher H., 4,407,990., Cl. 524-38.000.

Ide, Yuuichi; and Nukushina, Harunobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for controlling an air conditioning system. 4,407,139., Cl. 62-215.000.

Idemitsu Petrochemical Co., Ltd.: *See—*
Nomura, Manabu; Sugi, Norio; Tanaka, Takayoshi; and Hara, Koichi, 4,407,986., Cl. 523-200.000.

Ido, Tadashi: *See—*
Koike, Yoshiyasu; Kubo, Osamu; Ido, Tadashi; and Uwaha, Masanobu, 4,407,721., Cl. 252-62.590.

IG-Technical Research Inc.: *See—*
Iwase, Katsuhiko; and Saito, Minoru, 4,407,179., Cl. 83-865.000.

Iguchi, Nobuyoshi: *See—*
Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Sakasai, Toshio; and Iguchi, Nobuyoshi, 4,407,826., Cl. 426-7.000.

IHC Holland N.V.: *See—*
de Jager, Arie, 4,407,420., Cl. 212-199.000.

Ihringer, Ernest. Cleaning installation. 4,407,316., Cl. 134-104.000.

Iida, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Picture information filing system. 4,408,301., Cl. 364-900.000.

Iijima, Tetsuya; and Takahashi, Seiichi, to Nissan Motor Co., Ltd. Control for automobile air conditioning system. 4,407,446., Cl. 236-49.000.

Iizawa, Yoshihiro, to Ikebukuro Horo Kogyo Co., Ltd. Process for the preparation of inorganic fiber containing enamelware. 4,407,868., Cl. 427-376.200.

Ikebukuro Horo Kogyo Co., Ltd.: *See—*
Iizawa, Yoshihiro, 4,407,868., Cl. 427-376.200.

Ikeda, Masaki: *See—*
Nishino, Atsushi; Suzuki, Tadashi; Ikeda, Masaki; and Ohtani, Tadashi, 4,408,253., Cl. 361-293.000.

Ikeizumi, Hiroshi: *See—*
Enjouji, Katsuhisa; Ikeizumi, Hiroshi; Murata, Kenji; and Nishikawa, Syozaburo, 4,407,709., Cl. 204-192.0SP.

Ikeuchi, Satoru: *See—*
Suginaka, Shunji; Kobayashi, Ryuichiro; Ikeuchi, Satoru; Mizukura, Noboru; and Fujita, Noriko, 4,407,941., Cl. 430-566.000.

Imada, Isuke: *See—*
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Imahashi, Jinichi: *See—*
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.

Imai, Masumi; and Hirasawa, Kotaro, to Hitachi, Ltd. Method and apparatus for adjusting the supply of fuel to an internal combustion engine for an acceleration condition. 4,408,279., Cl. 364-431.050.

Imai, Tamotsu, to UOP Inc. Preparation of metal oxide-supported boron fluoride catalysts. 4,407,731., Cl. 502-203.000.

Imam, Imdad, to General Electric Company. Method for on-line detection of incipient cracks in turbine-generator rotors. 4,408,294., Cl. 364-508.000.

Imi Kynoch Limited: *See—*
Sutcliffe, Gordon R.; Warden, Stephen J.; and Humpherson, Donald, 4,407,062., Cl. 29-599.000.

Imlah, Forbes, to Burlington Industries, Inc. Impart machine for determining heat setting conditions. 4,407,164., Cl. 73-831.000.

Immaru, Daisaku: *See—*
Kawasaki, Takao; Immaru, Daisaku; Osaka, Yoshiaki; Tsuchiya, Tadashi; and Ono, Saichi, 4,407,799., Cl. 424-246.000.

Immunex Corporation: *See—*
Gillis, Steven, 4,407,945., Cl. 435-68.000.

Imperial Chemical Industries PLC: *See—*
Featherstone, William, 4,407,703., Cl. 203-43.000.
Ratcliffe, Maurice J.; and Roberts, Thomas A., 4,407,984., Cl. 523-115.000.

Ina, Katutoshi; Yamamoto, Kazuo; Higashiyama, Hirokichi; Ishikawa, Norio; and Miyoshi, Hiroshi, to Nippon Steel Corporation. High tensile steel and process for producing the same. 4,407,681., Cl. 148-12.00F.

Ina Seito Co., Ltd.: *See—*
Harada, Shozo; Ito, Kazuo; Shirai, Takayuki; and Koide, Tetsuya, 4,407,769., Cl. 264-60.000.

Inch, John D.: *See—*
Hennessy, Arnold; and Inch, John D., 4,407,025., Cl. 4-321.000.

Independent Broadcasting Authority: *See—*
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Index-Werke KG Hahn & Tessky: *See—*
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Industrie Pirelli S.p.A.: *See—*
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Ing. C. Olivetti & C., S.p.A.: *See—*
Adamoli, Contardo; Bernardis, Francesco; Cretaz, Franco; and Gaiardo, Mario, 4,407,591., Cl. 400-124.000.

Ingenieurkontor Lubeck: *See—*
Gutbier, Heinrich; Strasser, Karl; Limberg, Elmar; and Jensen, Volker, 4,407,903., Cl. 429-23.000.

Inohara, Shizuo; Masuda, Mitsuya; Iyehara, Sadahiro; Ueda, Minoru; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Color image display apparatus. 4,408,143., Cl. 315-366.000.

Inoue, Hachiro. Under-reaming pile bore excavator. 4,407,376., Cl. 175-267.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,408,113., Cl. 219-69.00M.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Electrical machining apparatus. 4,408,113., Cl. 219-69.00M.

Inoue, Takao; Wakahata, Tamotsu; Momose, Keigo; and Maeda, Yukio, to Matsushita Electric Industrial Co., Ltd. Alkaline galvanic cell. 4,407,914., Cl. 429-174.000.

Inoue, Yoshio: *See—*
Takao, Hiroyoshi; and Inoue, Yoshio, 4,407,989., Cl. 523-340.000.

Institute Po Physikochimia pri Ban: *See—*
Sheludko, Alexey D.; Ivanov, Rumen V.; Nikolov, Dobrin V.; and Nishkov, Ivan M., 4,407,715., Cl. 209-164.000.

International Business Machines Corporation: *See—*
Arnold, Robert W.; and Skinner, Dean W., 4,408,129., Cl. 307-270.000.
Bradley, David J., 4,408,200., Cl. 340-747.000.
Burr, Peter; Chase, Brian D.; Paton, Andrew; and Sowter, Brian R., 4,408,163., Cl. 324-404.000.
Bushaw, Kenneth A.; Gillingham, Ronald D.; Jorgenson, Gary W.; Manning, Clyde L.; and Steffes, Michael A., 4,408,231., Cl. 358-280.000.
Chu, Wei-Kan; and Howard, James K., 4,408,254., Cl. 361-321.000.
DasGupta, Sumit, 4,408,336., Cl. 377-34.000.
Fatula, Joseph J., Jr.; Garbarino, Paul L.; and Shepard, Joseph F., 4,407,058., Cl. 29-571.000.
Fleming, Rebecca P.; Lawhorne, Samuel, Jr.; Mele, John J.; and Prasad, Chandrika, 4,407,860., Cl. 427-98.000.
Galatha, Matthew J., 4,408,121., Cl. 235-494.000.
Grobman, Warren D., 4,408,338., Cl. 378-034.000.
Hall, David A.; and Olson, George P., 4,407,193., Cl. 101-93.010.
Hearn, Anthony R., 4,408,238., Cl. 360-104.000.
Plow, Gregory M., 4,408,273., Cl. 364-200.000.
Rogers, Dennis L.; and Widmer, Albert X., 4,408,167., Cl. 330-261.000.

International Harvester Co.: *See*—
Allori, Aldo; Wilger, John A.; and Voss, Julian D., 4,407,394., Cl. 188-71.400.
Rozeboom, Henry, 4,407,372., Cl. 172-572.000.
Swanson, William C.; Krukow, Eugene J.; and Stroup, Norman G., 4,407,109., Cl. 56-11.900.
International Mill Service, Inc.: *See*—
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International Minerals & Chemical Corp.: *See*—
Allen, Hanceford L.; Berry, William W.; and Leibfried, Robert W., 4,407,725., Cl. 502-25.000.
International Paint Company Limited, The: *See*—
Sghibartz, Cristian M., 4,407,997., Cl. 524-202.000.
International Paper Company: *See*—
Swenson, Rita, 4,407,474., Cl. 248-97.000.
International Rectifier Corporation: *See*—
Gould, Herbert J., 4,408,216., Cl. 357-15.000.
International Standard Electric Corporation: *See*—
Braun, Reinhold, 4,408,165., Cl. 328-134.000.
Domhan, Gerold; Hartl, Franz; and Vogelgsang, Kurt, 4,408,111., Cl. 200-318.000.
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International Telephone and Telegraph Corporation: *See*—
Hockham, George A., 4,408,205., Cl. 343-16.00R.
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IRD Mechanalysis, Inc.: *See*—
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Irvin, Howard B., to Phillips Petroleum Company. Separation of polymer of conjugated diene from a solution polymerization solvent using prestripping step. 4,408,039., Cl. 528-500.000.
Irwin, David M., to Potters Supply Company, The. Handling and support system for kiln fired ware. 4,407,654., Cl. 432-258.000.
Irwin, Maurice J.: *See*—
Murray, Richard; and Irwin, Maurice J., 4,407,611., Cl. 405-284.000.
Iseki, Kazuo, to Ohta Company Limited. Hinge. 4,407,044., Cl. 16-237.000.
Ishida, Keiichi: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,407,959., Cl. 435-288.000.
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Ishii, Daisuke, to Nippon Electric Co., Ltd. Radio paging system capable of accepting message with access of paging receiver. 4,408,099., Cl. 179-2.0EC.
Ishii, Jun, to Tokoy Shibaura Denki Kabushiki Kaisha. Keyboard switch circuit. 4,408,184., Cl. 340-365.00S.
Ishii, Kenzo: *See*—
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.
Ishii, Masami; Kato, Nobuharu; and Hota, Mikio, to Aisin Seiki Kabushiki Kaisha. Method and apparatus for performing hot air welding of thermoplastic resin parts. 4,407,691., Cl. 156-304.200.
Ishii, Shigeru: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,407,813., Cl. 424-273.00P.
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Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
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Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, to Mitsubishi Gas Chemical Company, Inc. Process for producing acetaldehyde. 4,408,080., Cl. 568-484.000.
Isohata, Junji: *See*—
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Istituto Sieroteropico E. Vaccinogeno Toscano "Sclavo" S.p.A.: *See*—
Tabacco, Alessandro; and Tarli, Paolo, 4,407,962., Cl. 436-74.000.
Itani, Abdallah M.: *See*—
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Ito, Kazuo: *See*—
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Ito, Takeo: *See*—
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Ito, Toshihiko, to Okumura Corporation. Soil transporting vehicle for transporting soils escavated by shield machine. 4,407,622., Cl. 414-468.000.
Ito, Yukio, to Victor Company of Japan, Ltd. Recording mode locking system in a video signal magnetic recording apparatus. 4,408,235., Cl. 360-71.000.
Itoh, Satoru, to Fuji Xerox Co., Ltd. Image reading device. 4,408,232., Cl. 358-280.000.
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Iwai, Hiroshi: *See*—
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Iwai, Masatoshi: *See*—
Kirihara, Shigeki; and Iwai, Masatoshi, 4,407,900., Cl. 428-659.000.
Iwase, Katsuhiko; and Saito, Minoru, to IG-Technical Research Inc. Process and apparatus for cutting an elongate complex structure. 4,407,179., Cl. 83-865.000.
Iwata, Kazuroh: *See*—
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Iwata, Masayosi; Furuhashi, Kenshi; and Ito, Hiroyasu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Lever switch arrangement for motor vehicle. 4,408,104., Cl. 200-61.540.
Iwata, Yasuhiro: *See*—
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Izumi, Masao; Maruyama, Hideki; and Yoshida, Hiroshi, to Nissan Motor Company, Ltd. Flow outlet structure for automotive air conditioner. 4,407,186., Cl. 98-2.000.
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Hanson, Charles B., 4,407,081., Cl. 37-141.00T.
Jackson, Frederick D., to Jaybee Engineering Pty. Limited. Distribution and treatment means. 4,407,217., Cl. 118-24.000.
Jackson, Graham C.: *See*—
Crabb, Trevor A.; Jackson, Graham C.; and Jupp, Philip A., 4,407,670., Cl. 71-67.000.
Jackson, William R. Drive operated by receptacles alternately water filled and rendered buoyant. 4,407,130., Cl. 60-496.000.
Jadow, Henry C., to Kristy Wells, Inc. Sculptured artificial nail. 4,407,310., Cl. 132-73.000.
Jaffa, David, to Precision Screen Machines, Inc. Screen printing machine. 4,407,195., Cl. 101-123.000.
James River-Graphics, Inc.: *See*—
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Jansson, Erik C., to Aktiebolaget Bahco Verktyg. Display pack. 4,407,413., Cl. 206-493.000.
Japan Atomic Energy Research Institute: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,407,846., Cl. 427-35.000.
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Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, 4,407,927., Cl. 430-197.000.
Jardin, Albert C. Solar furnace. 4,407,268., Cl. 126-430.000.
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Feldt, Adolf; Jarnuszak, Ulrich; Kiessling, Rolf; and Kock, Juergen, 4,407,341., Cl. 141-97.000.
Jaybee Engineering Pty. Limited: *See*—
Jackson, Frederick D., 4,407,217., Cl. 118-24.000.
Jensen, Eric L.; and Lee, Harry W., Jr., to Reynolds Metals Company. Container pressurization system. 4,407,340., Cl. 141-67.000.
Jensen, Norman E., to Honeywell Inc. Retard sensor and energy converter. 4,407,201., Cl. 102-248.000.
Jensen, Volker: *See*—
Guthier, Heinrich; Strasser, Karl; Limberg, Elmar; and Jensen, Volker, 4,407,903., Cl. 429-23.000.

Jeschke, Willi, to Heidelberger Druckmaschinen AG. Device and method of monitoring dampening and inking equilibrium in offset printing units. 4,407,197., Cl. 101-148.000.
Jezbera, Val K., to Dataproducts Corporation. Print hammer. 4,407,194., Cl. 101-93.340.
Jockel, Alfred: *See*—
Denner, Peter; Ernst, Egon; and Jockel, Alfred, 4,407,064., Cl. 29-726.000.
John Crane-Houdaille, Inc.: *See*—
Trytek, Joseph J., 4,407,512., Cl. 277-96.100.
John Hopkins University, The: *See*—
Fraser, Allan B., 4,408,169., Cl. 331-65.000.
Johnson, David E. Limb exercise device. 4,407,496., Cl. 272-117.000.
Johnson & Johnson Baby Products Company: *See*—
Pieniak, Heinz A., 4,407,284., Cl. 604-385.000.
Johnson, Peter E. Method and apparatus for fabricating battery plate envelopes. 4,407,063., Cl. 29-623.200.
Johnson, Rubein V. Vented acoustic ear mold for hearing aids. 4,407,389., Cl. 181-135.000.
Johnston, Barry W. Closed loop solar collecting system operating a thermoelectric generator system. 4,407,129., Cl. 60-641.800.
Johnston, Christian W.: *See*—
Gould, Francis E.; and Johnston, Christian W., 4,408,023., Cl. 525-454.000.
Johnston, Russell A., to Otis Engineering Corporation; and Otis Engineering Corporation. Landing nipple for pumpdown well completion system. 4,407,364., Cl. 166-217.000.
Joll, David J.: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,407,830., Cl. 426-272.000.
Jones, Addison B., to Rockwell International Corporation. Planar bubble memory circuit fabrication. 4,407,859., Cl. 427-89.000.
Jones, Jackie D.: *See*—
Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., 4,407,885., Cl. 428-246.000.
Jones, Oscar E.: *See*—
Dilliner, Monte M., 4,407,252., Cl. 123-504.000.
Jones, William W., to C. K. Kelley & Sons, Inc. Single line pressure-pressure pneumatic tube system. 4,407,613., Cl. 406-84.000.
Jorgenson, Gary W.: *See*—
Bushaw, Kenneth A.; Gillingham, Ronald D.; Jorgenson, Gary W.; Manning, Clyde L.; and Steffes, Michael A., 4,408,231., Cl. 358-280.000.
Joseph, Brian J., to Eastman Kodak Company. Synchronizing mechanism for flash firing and shutter operation. 4,407,576., Cl. 354-135.000.
Joy Manufacturing Company: *See*—
Le Blanc, Louis H., Jr., 4,407,390., Cl. 181-230.000.
Jung, Alfred K., to Stauffer Chemical Company. Dialkylzinc compositions having improved thermal stability. 4,407,758., Cl. 260-429.900.
Jung, Wilhelm H.; and Diacont, George P., Jr., to AMF Incorporated. Twin needle with adjustable throat plate and feed plate. 4,407,210., Cl. 112-167.000.
Junge, Bodo; Stoltefuss, Jurgen; Muller, Lutz; Krause, Hans-Peter; and Sitt, Rudiger, to Bayer Aktiengesellschaft. N-phenoxy(or thio)hydrocarbon 3,4,5-trihydroxypiperidine derivatives, their use in medicine and in animal nutrition. 4,407,809., Cl. 424-267.000.
Jupp, Philip A.: *See*—
Crabb, Trevor A.; Jackson, Graham C.; and Jupp, Philip A., 4,407,670., Cl. 71-67.000.
Justice, Donald S. Electric power apparatus. 4,408,151., Cl. 320-2.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Harada, Takamasa, 4,408,201., Cl. 340-784.000.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Hirao, Mamoru; Hijiya, Hiromi; and Miyaka, Toshio, 4,408,041., Cl. 536-4.100.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kirihara, Shigeki; and Iwai, Masatoshi, 4,407,900., Cl. 428-659.000.
Kabushiki Kaisha Medos Kenkyusho: *See*—
Ouchi, Teruo, 4,407,273., Cl. 128-6.000.
Kabushiki Kaisha Meidensha: *See*—
Sakuma, Shinzo; Umeya, Eiji; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,408,107., Cl. 200-144.00B.
Kabushiki Kaisha Suwa Seikosha: *See*—
Wakai, Yoichi, 4,408,328., Cl. 371-62.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Iwata, Masayosi; Furuhashi, Kenshi; and Ito, Hiroyasu, 4,408,104., Cl. 200-61.540.
Kabushiki Kaisha Towa Giken: *See*—
An, Seiji, 4,408,330., Cl. 372-45.000.
Kadokura, Sadao; Tomie, Takashi; and Naoe, Masahiko, to Teijin Limited. Method for producing a perpendicular magnetic recording medium. 4,407,894., Cl. 428-457.000.
Kadowaki, Takashi: *See*—
Nakamura, Shinichi; Kadowaki, Takashi; Okumura, Mitsuhiro; and Takada, Syun, 4,407,940., Cl. 430-546.000.
Kahara, Toshiki: *See*—
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.
Kahovec, Jaroslav; Matejka, Zdenek; and Tomasek, Josef, to Ceskoslovenska akademie ved. Polymeric polydonor complexons and method for preparation thereof. 4,407,978., Cl. 521-56.000.
Kajino, Jirou: *See*—
Murata, Shigeki; Kajino, Jirou; and Minabe, Hitoshi, 4,408,236., Cl. 360-85.000.
Kamalski, Theodor I. E., to U.S. Philips Corporation. Receiver with field-strength dependent noise reduction control. 4,408,098., Cl. 381-11.000.
Kamio, Kunimasa: *See*—
Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, 4,408,086., Cl. 568-719.000.
Kamiya, Takashi; Teraji, Tsutomu; Nakai, Yoshiharu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,407,798., Cl. 424-246.000.
Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, to Japan Synthetic Rubber Co., Ltd. Photoresist composition. 4,407,927., Cl. 430-197.000.
Kanagawa, Shuichi: *See*—
Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, 4,408,086., Cl. 568-719.000.
Kanai, Hiromi: *See*—
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Kaneda, Isami: *See*—
Sugiyama, Hiroyuki; Kaneda, Isami; Abe, Ryozo; Sakakibara, Susumu; and Sano, Yasushi, 4,408,312., Cl. 369-43.000.
Kaneoya, Tatsuo: *See*—
Fukasawa, Akira; Yoshimura, Masakatsu; Kaneoya, Tatsuo; and Takahashi, Kenji, 4,407,756., Cl. 260-378.000.
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., to Ortho Pharmaceutical Corporation. Chemical compounds and processes. 4,408,060., Cl. 549-332.000.
Kanow, Willy: *See*—
Bahnsen, Bahne P.; and Kanow, Willy, 4,408,097., Cl. 381-15.000.
Kansai Paint Co., Ltd.: *See*—
Nakayama, Yasuharu; Iwai, Hiroshi; and Sukejima, Hajime, 4,408,028., Cl. 526-200.000.
Kanzaka, Yoshihiro, to Yoshida Kogyo, K.K. Buckle for belts or the like. 4,407,049., Cl. 24-230.0AS.
Kaplan, Irwin M., to Spectrum Four-Syte Corporation. Tamper-resistant security system for and method of operating and installing same. 4,408,251., Cl. 361-172.000.
Kapp, Joachim-Friedrich: *See*—
Kirsch, Gerald; Kapp, Joachim-Friedrich; and Rufer, Clemens, 4,407,823., Cl. 424-317.000.
Kapp, Ludwig J., to Ziyad Incorporated. Paper feeding apparatus for printing apparatus. 4,407,597., Cl. 400-625.000.
Kasahara, Yasushi; and Ashihara, Yoshihiro, to Fujizoki Pharmaceutical Co., Ltd. Method for determining the activity of the angiotensin-converting enzyme. 4,407,944., Cl. 435-18.000.
Kasuga, Akira: *See*—
Miyatsuka, Hajime; Kasuga, Akira; and Yamada, Yasuyuki, 4,407,901., Cl. 428-694.000.
Kataishi, Takao; and Yokoi, Nobufumi, to Misawa Home Co., Ltd. Mortar treating apparatus. 4,407,225., Cl. 118-425.000.
Kato, Hideo; and Wada, Hiroto, to Fukuoka Paper Manufacturing Co., Ltd. Corner pad. 4,407,898., Cl. 428-542.800.
Kato, Keigo; and Kuroiwa, Yosio, to Toyota Jidosha Kabushiki Kaisha. Intake heating apparatus of an internal combustion engine. 4,407,254., Cl. 123-549.000.
Kato, Kichiro: *See*—
Akagi, Motonobu; Tanahashi, Toshio; and Kato, Kichiro, 4,407,244., Cl. 123-339.000.
Kato, Masao: *See*—
Furuya, Setsuko; Ohnishi, Shunji; and Kato, Masao, 4,408,012., Cl. 525-161.000.
Kato, Masatoshi: *See*—
Yamanaka, Minoru; Suzuki, Mitsuyuki; Haneda, Hideo; Kato, Masatoshi; and Ohtsuki, Masataka, 4,407,448., Cl. 236-88.000.
Kato, Nobuharu: *See*—
Ishii, Masami; Kato, Nobuharu; and Hota, Mikio, 4,407,691., Cl. 156-304.200.
Katsura, Masaki: *See*—
Shiratori, Masayuki; and Katsura, Masaki, 4,407,778., Cl. 422-90.000.
Kausch, Marvin L., to Cromemco Inc. Single throw multi-grip latching mechanism. 4,407,536., Cl. 292-29.000.
Kavage, William T.; and Monroe, Marvin E., to Optek, Inc. Optical inspector for slat-type container filling machine. 4,408,295., Cl. 364-552.000.
Kavoussi, James P.: *See*—
Hartford, Louise D.; and Kavoussi, James P., 4,407,585., Cl. 368-12.000.
Kawada, Mitsuru: *See*—
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, 4,407,757., Cl. 260-413.000.
Kawagishi, Yoji: *See*—
Senshu, Hisashi; Ishikawa, Kazuhiro; Ishida, Yukihiko; and Kawagishi, Yoji, 4,407,924., Cl. 430-109.000.
Kawaguchi, Hidemi: *See*—
Sakuma, Shinzo; Umeya, Eiji; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,408,107., Cl. 200-144.00B.
Kawaguchi, Yoshio: *See*—
Nakata, Shuji; Nishikawa, Masahiro; and Kawaguchi, Yoshio, 4,408,114., Cl. 219-110.000.
Kawai, Taneichi: *See*—
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Kawakami, Satoru: *See*—
Fushiki, Takeshi; Tagawa, Tohru; and Kawakami, Satoru, 4,407,999., Cl. 524-276.000.

Kawakatsu, Shiro; and Honda, Shoji, to Daihatsu Motor Co., Ltd. Control apparatus and method for engine/electric hybrid vehicle. 4,407,132., Cl. 60-716.000.

Kawamura, Tomihiko: *See*—
Nakauchi, Jun; and Kawamura, Tomihiko, 4,407,895., Cl. 428-463.000.

Kawasaki, Hiroshi: *See*—
Naoi, Takashi; Kawasaki, Hiroshi; Yamaguchi, Jun; Tatsuta, Sumitaka; and Sera, Hidefumi, 4,407,939., Cl. 430-536.000.

Kawasaki, Kazuhiro: *See*—
Hijikata, Toshio; and Kawasaki, Kazuhiro, 4,407,683., Cl. 148-144.000.

Kawasaki, Masasuke. Non-roll tug-and-barge linkage. 4,407,214., Cl. 114-249.000.

Kawasaki, Takao; Immaru, Daisaku; Osaka, Yoshiaki; Tsuchiya, Tadashi; and Ono, Saichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. 2-Substituted-phenyl-1,3-perhydrothiazine-4-one. 4,407,799., Cl. 424-246.000.

Kazama, Seiji; and Tanaka, Michio, to Takeda Chemical Industries, Ltd. Method for curing urethane resins. 4,408,034., Cl. 528-54.000.

Kazami, Kazuyuki: *See*—
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Ohtsubo, Yoshiaki; and Akasaka, Shigeo, 4,407,573., Cl. 354-33.000.

Kazlauskas, Gasparas. Welding insert ring and method of welding therefor. 4,408,112., Cl. 219-61.000.

Kehl, Norman J.; and Unser, Richard D., to Coach and Car Equipment Corporation. Walk-over seat with latch. 4,407,542., Cl. 297-103.000.

Kehl, William L., to Gulf Research & Development Co. Catalytic supports with controlled pore properties. 4,407,730., Cl. 502-208.000.

Kehl, William L., to Gulf Research & Development Company. Catalytic supports with controlled pore properties. 4,407,732., Cl. 502-208.000.

Keller, Teddy M., to United States of America, Navy. Phthalonitrile resin from diphthalonitrile monomer and amine. 4,408,035., Cl. 528-183.000.

Kelley, Mark A.: *See*—
Schramme, Stephan H.; and Kelley, Mark A., 4,407,042., Cl. 16-2.000.

Kelly, John W., to Haskel Engineering & Supply Company. Apparatus for supplying and controlling hydraulic swaging pressure. 4,407,150., Cl. 72-61.000.

Kemble, Mern S. Mold cleaning apparatus. 4,407,037., Cl. 15-93.00R.

Kemmner, Ulrich, to Robert Bosch GmbH. Fuel supply unit. 4,407,642., Cl. 417-366.000.

Kemp, Roy A.: *See*—
Hall, Derrard M.; Kemp, Roy A.; and Such, Christopher H., 4,407,990., Cl. 524-38.000.

Kempf, Dennis D., to FMC Corporation. Apparatus having an improved flow control pinch valve for dispensing flowable materials. 4,407,434., Cl. 222-214.000.

Kendziorski, Edward. Portable, collapsible practice golf flagstaff with stowable ground spike. 4,407,505., Cl. 273-177.00R.

Kenogard AB: *See*—
Estberg, Magnus F. O., 4,407,076., Cl. 34-9.500.

Keogh, Michael J., to Union Carbide Corporation. Flame retardant compositions based on alkylene-alkyl acrylate copolymers. 4,407,992., Cl. 524-94.000.

Kerko, David J.; and Morse, David L., to Corning Glass Works. Very fast fading photochromic glass. 4,407,966., Cl. 501-13.000.

Kern, James L.: *See*—
Moskowitz, Ronald; Raj, Kuldip; and Kern, James L., 4,407,518., Cl. 277-1.000.

Kernforschungsanlage Julich GmbH: *See*—
Barnert, Eike, 4,407,230., Cl. 118-716.000.

Kernforschungszentrum Karlsruhe G.m.b.H.: *See*—
Schretzmann, Klaus; Dorner, Stefan; and Schumacher, Gustav, 4,407,774., Cl. 376-300.000.

Kester, Dennis E.: *See*—
Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,407,873., Cl. 428-35.000.

Kett Electric Laboratory: *See*—
Fujita, Toshio, 4,408,128., Cl. 324-65.00R.

Khudaverdian, Vreij. Automatic tow rope rewinder. 4,407,460., Cl. 242-86.50A.

Kiernan, Jane A.; and Baker, Pamela K., to American Cyanamid Company. Phenylethanolamine derivatives and acid addition salts thereof for the depression of fat deposition in warm blooded animals. 4,407,819., Cl. 424-304.000.

Kiesling, Roy A.; and Kiesling, Roy A., III. Time delayed recording system. 4,408,309., Cl. 369-7.000.

Kiesling, Roy A., III: *See*—
Kiesling, Roy A.; and Kiesling, Roy A., III, 4,408,309., Cl. 369-7.000.

Kiessling, Rolf: *See*—
Feldt, Adolf; Jarnuszak, Ulrich; Kiessling, Rolf; and Kock, Juergen, 4,407,341., Cl. 141-97.000.

Kijesky, Michael M.; and Bogle, Charles T., to United States of America, Navy. Signal processing system. 4,408,284., Cl. 364-485.000.

Kikkoman Shoyu Co. Ltd.: *See*—
Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Sakasai, Toshio; and Iguchi, Nobuyoshi, 4,407,826., Cl. 426-7.000.

Kikuchi, Hiroshi; and Sugimoto, Koichi, to Hitachi, Ltd. Method and apparatus of robot teaching. 4,408,286., Cl. 364-513.000.

Kimura, Shigeru, to Nifco Inc. Fastener. 4,407,618., Cl. 411-40.000.

Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, to Nissan Motor Company, Limited. Method of producing a flat thin film type oxygen sensor. 4,407,057., Cl. 29-570.000.

Kimura, Tadao; and Toriyama, Hideoki, to Sanyo-Kokusaku Pulp Co., Ltd. Coating system for semi-fluid coating composition comprising cement and aggregate. 4,407,222., Cl. 118-110.000.

Kimura, Toshihide: *See*—
Takeuchi, Yuzo; Kimura, Toshihide; and Takada, Shigetaka, 4,407,248., Cl. 123-439.000.

Kindell, Jerry L., to Honeywell Information Systems Inc. Circuit for implementing a digital computer instruction. 4,408,271., Cl. 364-200.000.

King, James D.; Burkhardt, Gary L.; Barton, John R.; and Matzkanin, George A., to Southwest Research Institute. Acoustic Barkhausen stress detector apparatus and method. 4,408,160., Cl. 324-209.000.

King, Nigel D., to Exxon Research and Engineering Co. Self-cleaning submersible pump. 4,407,636., Cl. 417-118.000.

Kingsley, Stuart A.: *See*—
Culshaw, Brian; Ball, Peter R.; Kingsley, Stuart A.; and Davies, David E. N., 4,408,354., Cl. 455-610.000.

Kingston, John C. Wheelchair loading device for passenger carrying vehicles. 4,407,624., Cl. 414-546.000.

Kiozpeoplou, Diana, to Colgate-Palmolive Company. Dentifrice. 4,407,788., Cl. 424-49.000.

Kirihara, Shigeki; and Iwai, Masatoshi, to Kabushiki Kaisha Kobe Seiko Sho. Electroplated corrosion resistant steels and method for manufacturing same. 4,407,900., Cl. 428-659.000.

Kirner, John F.: *See*—
Eskinazi, Victoria; Kirner, John F.; and Wilson, Charles R., 4,407,738., Cl. 502-334.000.

Kirsch, Gerald; Kapp, Joachim-Friedrich; and Rufer, Clemens, to Schering Aktiengesellschaft. Novel phenylacetic acid derivatives. 4,407,823., Cl. 424-317.000.

Kirsch, Howard C., to Mostek Corporation. MOS Bootstrapped buffer for voltage level conversion with fast output rise time. 4,408,136., Cl. 307-475.000.

Kitamura, Tadanori; and Takao, Nobuyuki, to Nitto Boseki Co., Ltd. Process for coating chopped strand of glass fiber with thermosetting resin. 4,407,866., Cl. 427-221.000.

Kitchen, William D., to Electromark, division of Mohawk International Inc. Electrochemical marking apparatus. 4,408,215., Cl. 346-165.000.

Kiyoshima, Hiroshi, to Singer Company, The. Convertible bed for overedge sewing machine. 4,407,211., Cl. 112-260.000.

Klein, George C. Anti-skid device for vehicles. 4,407,549., Cl. 303-6.00C.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Schneider, Wolfangang; Peters, Josef; and Gaffal, Karl, 4,407,631., Cl. 415-122.00R.

Kleinschmit, Peter: *See*—
Schwarz, Rudolf; Kleinschmit, Peter; Liedtke, Christa; and Wolff, Siegfried, 4,408,064., Cl. 556-427.000.

Kleinsorgen, Klaus; and Munch, Erich, to Varta Batterie Aktiengesellschaft. Metering of paste onto a carrier tape. 4,407,338., Cl. 141-1.000.

Kleman, Joseph F. Portable and adjustable apparatus for cleaning, grooming, and otherwise treating dogs and other animals of similar size. 4,407,234., Cl. 119-158.000.

Klimek, Boleslaw M.: *See*—
Dvoracheck, Harold A.; and Klimek, Boleslaw M., 4,407,553., Cl. 339-14.00P.

Klockner-Humboldt-Deutz AG: *See*—
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,407,449., Cl. 237-12.30R.

Klockner-Humboldt-Deutz AG (Branch Establishment Fahr): *See*—
Wessel, Ulrich; and Scherer, Albrecht, 4,407,115., Cl. 56-370.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Rosendahl, Peter; and Renius, Karl T., 4,407,401., Cl. 192-61.000.

Klockner-Werke Aktiengesellschaft: *See*—
Wiechmann, Karl-Ernst, 4,407,438., Cl. 226-15.000.

Kluttz, Marvin H.: *See*—
Milberger, Lionel J.; Horn, Charles E.; and Kluttz, Marvin H., 4,407,183., Cl. 91-1.000.

Knebel & Rottger, Firma: *See*—
Knebel, Werner; Ronzon, Norbert; and Weidner, Eugen, 4,407,444., Cl. 236-12.100.

Knebel, Werner; Ronzon, Norbert; and Weidner, Eugen, to Knebel & Rottger, Firma. Thermostatically controlled mixer battery. 4,407,444., Cl. 236-12.100.

Knerr, Allan R.: *See*—
Sollner, George H.; Disque, Donny R.; and Knerr, Allan R., 4,408,032., Cl. 528-48.000.

Kniskern, Peter J.; Hagopian, Arpi; and Carlo, Dennis J., to Merck & Co., Inc. Meningitis vaccine. 4,407,949., Cl. 435-101.000.

Kobari, Harukuni: *See*—
Takeuchi, Takashi; and Kobari, Harukuni, 4,408,326., Cl. 371-38.000.

Kobari, Yukio: *See*—
Sakuma, Shinzo; Umeya, Eiji; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,408,107., Cl. 200-144.00B.

Kobayashi, Hiroyuki; Ohki, Yoshimasa; Toyoda, Yukio; and Akasaki, Isamu, to Matsushita Electric Industrial Company, Limited. GaN Electroluminescent semiconductor device and method for making the same. 4,408,217., Cl. 357-17.000.

Kobayashi, Masakazu, to Kyowa Vacuum Engineering, Ltd. Vacuum apparatus. 4,407,140., Cl. 62-268.000.

Kobayashi, Ryuichiro: *See*—
Suginaka, Shunji; Kobayashi, Ryuichiro; Ikeuchi, Satoru; Mizukura, Noboru; and Fujita, Noriko, 4,407,941., Cl. 430-566.000.

Kobayashi, Takashi: *See*—
Takishita, Takashi; Sutoh, Shinji; Tanaka, Noriyuki; Kobayashi, Takashi; and Furukawa, Kenji, 4,407,354., Cl. 165-42.000.

Koch, Fritz E.: *See*—
Wilmsmann, Hans-Peter; and Koch, Fritz E., 4,407,471., Cl. 248-63.000.

Koch, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of optically active 2-chloropropionic acid esters. 4,408,068., Cl. 560-226.000.

Kochs Adler AG: *See*—
Meyer, Horst, 4,407,208., Cl. 112-121.120.

Kock, Juergen: *See*—
Feldt, Adolf; Jarnuszak, Ulrich; Kiessling, Rolf; and Kock, Juergen, 4,407,341., Cl. 141-97.000.

Koda, Yoshio, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Device for simulation of projected image. 4,407,655., Cl. 434-219.000.

Koerner, Gotz: *See*—
Holtschmidt, Ulrich; Koerner, Gotz; Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,408,031., Cl. 528-26.000.

Koetz, Hans-Joachim: *See*—
Muellejans, Herbert; and Koetz, Hans-Joachim, 4,407,358., Cl. 165-166.000.

Koflach Sportgerate Gesellschaft m.b.H.: *See*—
Bucheder, Erwin, 4,407,048., Cl. 24-69.0SK.

Koh, Takuji: *See*—
Arichi, Isao; Waniisi, Tetuya; and Koh, Takuji, 4,407,588., Cl. 368-118.000.

Kohaut, John E., to Raceway Components, Inc. Trimless carpet base insert device. 4,408,090., Cl. 174-48.000.

Koide, Tetsuya: *See*—
Harada, Shozo; Ito, Kazuo; Shirai, Takayuki; and Koide, Tetsuya, 4,407,769., Cl. 264-60.000.

Koike, Yoshiyasu; Kubo, Osamu; Ido, Tadashi; and Uwaha, Masanobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Process for manufacturing powder for magnetic recording medium. 4,407,721., Cl. 252-62.590.

Koiwa, Atsushi: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,407,745., Cl. 260-112.50R.

Kojima, Tokumitsu: *See*—
Shiraki, Yoshihiro; and Kojima, Tokumitsu, 4,407,127., Cl. 60-641.500.

Kokusan Denki Co., Ltd.: *See*—
Boyama, Kimihiro, 4,407,246., Cl. 123-415.000.

Kolenik, Steve A.: *See*—
Langer, Alois A.; Kolenik, Steve A.; Heilman, Marlin S.; Mirowski, Mieczyslaw; and Mower, Morton M., 4,407,288., Cl. 128-419.0PG.

Kolycheck, Edmond G., to B. F. Goodrich Company, The. Curable polyurethanes. 4,408,020., Cl. 525-415.000.

Komatsu, Michiyasu; Tsuge, Akihiko; and Ota, Hiroyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Sintered body of ceramics and preparation thereof. 4,407,970., Cl. 501-97.000.

Komatsu, Michiyasu; Tsuge, Akihiko; and Ohta, Hiroyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Sintered body of silicon nitride-based ceramics. 4,407,971., Cl. 501-97.000.

Komatsu, Shigeru; Nagai, Kunihiko; Koyama, Takuo; Tachiuchi, Tsuguji; and Hirahata, Shigeru, to Hitachi, Ltd. Pattern display apparatus. 4,408,197., Cl. 340-720.000.

Kondo, Takashi; and Hashimoto, Nobuo, to Minolta Camera Kabushiki Kaisha. Distance measuring arrangement. 4,408,288., Cl. 364-525.000.

Konishi, Masayuki: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,407,745., Cl. 260-112.50R.

Konishiroku Photo Ind. Co., Ltd.: *See*—
Mizukura, Noboru; and Koyama, Mikio, 4,407,938., Cl. 430-533.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Nakamura, Shinichi; Kadowaki, Takashi; Okumura, Mitsuhiro; and Takada, Syun, 4,407,940., Cl. 430-546.000.
Suginaka, Shunji; Kobayashi, Ryuichiro; Ikeuchi, Satoru; Mizukura, Noboru; and Fujita, Noriko, 4,407,941., Cl. 430-566.000.

Konno, Mutsuo: *See*—
Hashimoto, Kazuo; and Konno, Mutsuo, 4,408,182., Cl. 340-321.000.

Konz, Gerald J. Apparatus for immobilizing animals of randomly encountered sizes. 4,407,232., Cl. 119-103.000.

Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; Bischoff, Ludwig; Penkert, Rosemarie; and Siefert, Eicke, to Gesellschaft fur Biotechnologische Forschung mbH (GBF). Process for obtaining metal-free corrinoids. 4,407,947., Cl. 435-85.000.

Koppers Company, Inc.: *See*—
Gerber, Donald J., 4,407,352., Cl. 165-9.100.

Kopsel, Manfred; and Emberger, Roland, to Haarmann & Reimer GmbH. Di- and Tetra-hydrobenzofuranones as scents and aroma substances. 4,407,740., Cl. 252-522.00R.

Korenko, Michael K. Solid solution strengthened duct and cladding alloy D9-B1. 4,407,673., Cl. 75-128.00A.

Korff, Walter H. Window construction for passenger vehicles. 4,407,540., Cl. 296-146.000.

Kostner, Armin; Lenhart, Richard; and Bittner, Klaus-Jurgen, to Hoechst Aktiengesellschaft. Double-walled hollow rod of flexible tubular material. 4,407,339., Cl. 141-10.000.

Koszi, Louis A.: *See*—
Hartman, Robert L.; Koszi, Louis A.; and Schwartz, Bertram, 4,408,331., Cl. 372-46.000.

Kotobuki Seiyaku Company Limited: *See*—
Tomiyama, Tsuyoshi; and Tomiyama, Akira, 4,407,816., Cl. 424-275.000.

Koukal, Heinz; and Grimm, Hermann, to Daimler-Benz Aktiengesellschaft. Sliding guide mechanism. 4,407,167., Cl. 74-501.00R.

Kovach, Stephen M.: *See*—
Myers, George D., deceased; Hettinger, William P., Jr.; and Kovach, Stephen M., 4,407,714., Cl. 208-120.000.

Kovalchik, Donald P.; and Battocletti, Frank E., to TransData, Inc. Time division multiplier transducer with digitally derived phase shift adjustment for reactive power and energy measurement. 4,408,283., Cl. 364-483.000.

Koyama, Haruo: *See*—
Miyakawa, Nobuhiro; Fujii, Masanori; Maekawa, Kouzi; Koyama, Haruo; and Teshima, Takashi, 4,407,923., Cl. 430-106.600.

Koyama, Mikio: *See*—
Mizukura, Noboru; and Koyama, Mikio, 4,407,938., Cl. 430-533.000.

Koyama, Takuo: *See*—
Komatsu, Shigeru; Nagai, Kunihiko; Koyama, Takuo; Tachiuchi, Tsuguji; and Hirahata, Shigeru, 4,408,197., Cl. 340-720.000.

Kozima, Katuhiro: *See*—
Sawa, Shigeki; Nagasaka, Hiroyasu; Saito, Makoto; Mizuno, Masashi; and Kozima, Katuhiro, 4,407,682., Cl. 148-128.000.

Kozinda, Zinaida J.: *See*—
Gorbacheva, Irina N.; Kozinda, Zinaida J.; Suvorova, Elena G.; Chertov, Viktor A.; Dvoskin, Semen I.; Platonova, Evdokia V.; Podgaevskaya, Tatyana A.; and Skvirenko, Andrei B., 4,407,748., Cl. 260-153.000.

Krabbe, Wilfried, to Philipp Holzman AG. Liquid storage tank with steel-reinforced concrete exterior. 4,407,098., Cl. 52-167.000.

Kralik, Douglas R.; and Mitchell, Hal D., to Figgie International Inc. Suspension system for headgear. 4,407,021., Cl. 2-416.000.

Kramer, Kenneth E.: *See*—
Dreikorn, Barry A.; and Kramer, Kenneth E., 4,407,820., Cl. 424-304.000.

Krause, Hans-Peter: *See*—
Junge, Bodo; Stoltefuss, Jurgen; Muller, Lutz; Krause, Hans-Peter; and Sitt, Rudiger, 4,407,809., Cl. 424-267.000.

Krauss-Maffei AG: *See*—
Schwarzler, Peter, 4,408,139., Cl. 310-13.000.

Krief, Alain, to Roussel Uclaf. Methyl cyclopropane-1,3-dicarboxylate. 4,408,066., Cl. 560-124.000.

Krishnakumar, Suppayan M.: *See*—
Beck, Martin H.; Krishnakumar, Suppayan M.; and Collette, Wayne N., 4,407,651., Cl. 432-11.000.

Kristy Wells, Inc.: *See*—
Jadow, Henry C., 4,407,310., Cl. 132-73.000.

Krukow, Eugene J.: *See*—
Swanson, William C.; Krukow, Eugene J.; and Stroup, Norman G., 4,407,109., Cl. 56-11.900.

Krzywdziak, Alain: *See*—
Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,407,584., Cl. 366-279.000.

Kubbota, Masashi; and Noda, Touru, to Mitsubishi Paper Mills, Ltd. Process for preparing a polyolefin resin-coated paper for photographic use. 4,407,896., Cl. 428-513.000.

Kubo, Jun; and Honda, Minoru, to Nissan Motor Company, Limited. Method and device for determining acceleration and/or deceleration of a moving object. 4,408,290., Cl. 364-566.000.

Kubo, Kanji; and Wada, Kenichi, to Hitachi, Ltd. Data processing system with data cross-block-detection feature. 4,408,275., Cl. 364-200.000.

Kubo, Osamu: *See*—
Koike, Yoshiyasu; Kubo, Osamu; Ido, Tadashi; and Uwaha, Masanobu, 4,407,721., Cl. 252-62.590.

Kuchinsky, Saul; Bellman, Robert H.; and Ogle, James A., to Burroughs Corporation. Method of making an assembly of electrodes. 4,407,934., Cl. 430-314.000.

Kudirka, Paul E., to Shintron Company, Inc. Video character generator. 4,408,198., Cl. 340-729.000.

Kuhl, Henry Y. Apparatus for removal of mold from the exterior of meat products. 4,407,036., Cl. 15-3.130.

Kuhlmann, Fernand: *See*—
Wanetzky, Erwin; Hugo, Franz; and Kuhlmann, Fernand, 4,407,488., Cl. 266-148.000.

Kuhlmann, Gerhard, to Robert Bosch GmbH. Tool-clamping device. 4,407,615., Cl. 408-239.00A.

Kuhls, Jurgen; and Hartwimmer, Robert, to Hoechst Aktiengesellschaft. Free-flowing sintering powders which have improved properties and are based on tetrafluoroethylene polymers and a process for their manufacture. 4,408,007., Cl. 524-546.000.

Kuhn, Klaus G. Stuffing attachment for a continuously operating crinkling unit. 4,407,052., Cl. 26-2.00R.

Kukolja, Stjepan; and Pfeil, Janice L., to Eli Lilly and Company. Unsymmetrical azetidinone aldehyde disulfides and process. 4,407,750., Cl. 260-239.00A.

Kume, Kazunari: *See*—
Ohno, Hideshi; Kume, Kazunari; Osaka, Takatoshi; Nishimura, Katsuo; Tamaru, Munetaka; and Ode, Sadao, 4,407,590., Cl. 368-204.000.

Kummer, Joseph T.; and Oei, Djong-Gie, to Ford Motor Company. Chemically regenerable redox fuel cell and method of operating the same. 4,407,902., Cl. 429-15.000.

Kunihiro, Motoo; Atsumi, Tomiaki; Kuse, Kazumasa; and Ishigaki, Masahiro, to Toyo Rubber Industry Co., Ltd., The; and Toyoto Jidosha Kogyo Kabushiki Kaisha. Rubber bearing device having air damping capacity. 4,407,491., Cl. 267-140.100.

Kuo, Clinton C. K., to Motorola, Inc. Memory with permanent array division capability. 4,408,305., Cl. 365-189.000.

Kuo, Clinton C. K., to Motorola, Inc. Column and row erasable EE-PROM. 4,408,306., Cl. 365-218.000.

Kupec, James D.: *See*—
Guterman, Daniel C.; and Kupec, James D., 4,408,303., Cl. 365-205.000.

Kurachi, Hisao; Ito, Takeo; and Onoda, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Power-operated typewriter. 4,407,592., Cl. 400-54.000.

Kurata, Masami: *See*—
Moriguchi, Fujio; and Kurata, Masami, 4,408,212., Cl. 346-76.0PH.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Hashizume, Hideyuki; and Tsuchiya, Tadashi, 4,407,887., Cl. 428-332.000.
Kawasaki, Takao; Immaru, Daisaku; Osaka, Yoshiaki; Tsuchiya, Tadashi; and Ono, Saichi, 4,407,799., Cl. 424-246.000.

Kurihara, Masao: *See*—
Nakamura, Tstomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, 4,407,353., Cl. 165-39.000.

Kurohata, Hitoshi: *See*—
Watanabe, Masayuki; Yamaya, Hiroshi; and Kurohata, Hitoshi, 4,407,552., Cl. 339-143.00R.

Kuroiwa, Yosio: *See*—
Kato, Keigo; and Kuroiwa, Yosio, 4,407,254., Cl. 123-549.000.

Kurosawa, Kei; and Shibata, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing semiconductor device. 4,407,851., Cl. 427-39.000.

Kuse, Kazumasa: *See*—
Kunihiro, Motoo; Atsumi, Tomiaki; Kuse, Kazumasa; and Ishigaki, Masahiro, 4,407,491., Cl. 267-140.100.

Kusmer, Raymond J., to McGraw-Edison Company. Plaster frame for recessed lighting. 4,408,262., Cl. 362-147.000.

Kuster, Erich: *See*—
Goossens, Bernhard; Kuster, Erich; Dahmen, Kurt; and Barthell, Eduard, 4,408,073., Cl. 564-204.000.

Kuwahara, Hisao, to Tokyo Shibaura Denki Kabushiki Kaisha. Hysteresis circuit. 4,408,132., Cl. 307-359.000.

Kuyava, Charles C.: *See*—
Burton, John H.; Staehle, Bradford G.; and Kuyava, Charles C., 4,407,278., Cl. 128-79.000.

Kwan, William C. T., to Rolls-Royce Limited. Fuel burners. 4,407,128., Cl. 60-737.000.

Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, to Dr. C. Otto & Comp. G.m.b.H. Apparatus to extract gases evolving during charging of a coke oven. 4,407,702., Cl. 202-263.000.

Kyburz, Emilio: *See*—
Hunkeler, Walter; and Kyburz, Emilio, 4,407,752., Cl. 260-239.30P.

Kydd, Paul H., to HRI, Inc. Method for in situ recovery of heavy crude oils and tars by hydrocarbon vapor injection. 4,407,367., Cl. 166-267.000.

Kyowa Vacuum Engineering, Ltd.: *See*—
Kobayashi, Masakazu, 4,407,140., Cl. 62-268.000.

Laar, Hans, to Siemens Aktiengesellschaft. Device at cable ends to serve as a preparation for splicing. 4,408,091., Cl. 174-74.00R.

Labeda, David P.; Martin, John H. E. J.; and Goodman, Joseph J., to American Cyanamid Company. Process for producing antibiotic X-14868A. 4,407,946., Cl. 435-75.000.

Laboratoire L. Lafon: *See*—
Lafon, Louis, 4,407,822., Cl. 424-315.000.

Laboratoires Chauvin-Blache: *See*—
Bonne, Claude; Coquelet, Claude; and Sincholle, Daniel, 4,407,812., Cl. 424-273.00R.

Ladet, Michel; Lefebvre, Jacques; and Patrie, Jos, to Societe de Vente de l'Aluminium Pechiney. Aluminum electrical contacts and method of making same. 4,408,110., Cl. 200-263.000.

Lafon, Louis, to Laboratoire L. Lafon. Benzamido-alkyl-hydroxamic acid derivatives. 4,407,822., Cl. 424-315.000.

Landau, Richard F., to Eaton Corporation. Method for operating a magnetron sputtering apparatus. 4,407,708., Cl. 204-192.00R.

Landenberger, Ulric, to General Motors Corporation. Chain motion measuring device. 4,407,162., Cl. 73-527.000.

Landis, Arthur M.: *See*—
deRosset, Armand J.; Priegnitz, James W.; and Landis, Arthur M., 4,408,065., Cl. 560-67.000.

Landry, Deborah N.: *See*—
Lee, Lieng-Huang; and Landry, Deborah N., 4,407,920., Cl. 430-59.000.

Langdon, William K., to BASF Wyandotte Corporation. Non-ionic surfactants containing acetal groups. 4,408,084., Cl. 568-601.000.

Langer, Alois A.; Kolenik, Steve A.; Heilman, Marlin S.; Mirowski, Mieczyslaw; and Mower, Morton M., to Mirowski, Mieczyslaw. Implantable heart stimulator and stimulation method. 4,407,288., Cl. 128-419.0PG.

LaPrade, Steve A.: *See*—
Widener, Joseph; Britt, James M.; and LaPrade, Steve A., 4,407,969., Cl. 501-95.000.

Lapsys, Algis L., to United States of America, Army. Resilient band structure having improved laminated core and drive shoes. 4,407,550., Cl. 305-35.0EB.

Larsen, Ole J. F. Method and apparatus for producing and laying a ballasted mat for ground stabilization. 4,407,606., Cl. 405-17.000.

Larson, Wayne F., to Supra Products, Inc. Peripheral key tumbler lock. 4,407,147., Cl. 70-365.000.

Lasater, Henry C. Liquid degasification device. 4,407,665., Cl. 55-55.000.

Latala, John R.: *See*—
Grabowski, John S.; Shiau, Chin-Chih; and Latala, John R., 4,408,342., Cl. 382-9.000.

Lathrop, Patrick J.; and Rothrock, Phyllis C., to Carnation Company. Instant refried bean powder and process for producing the same. 4,407,840., Cl. 426-629.000.

Latimer, John P.; and Miller, Glenn E., to Deepsea Ventures, Inc. Liquid flow system including multi-axial liquid flow screening means for excluding oversized slender objects carried by a liquid. 4,407,716., Cl. 210-155.000.

Lauro, Luciano: *See*—
Bedini, Raffaele; Lauro, Luciano; and Pinotti, Pier C., 4,408,280., Cl. 364-474.000.

Lawhorne, Samuel, Jr.: *See*—
Fleming, Rebecca P.; Lawhorne, Samuel, Jr.; Mele, John J.; and Prasad, Chandrika, 4,407,860., Cl. 427-98.000.

Lawrence, George J.: *See*—
Bowen, Terry P.; Lawrence, George J.; and Wiley, Lawrence G., 4,408,353., Cl. 455-608.000.

Lazerson, Max M.: *See*—
Bohme, Rolf C.; and Lazerson, Max M., 4,407,415., Cl. 209-556.000.

Lazrus, Julian: *See*—
Bauer, Peter; and Lazrus, Julian, 4,407,032., Cl. 8-158.000.

Lazzari, William B., to Western Electric Company, Inc. Safety scaffold for metal melting furnaces. 4,407,392., Cl. 182-128.000.

Le, Tri C.; and Noble, Bruce P., to ACF Industries, Incorporated. Pressure energized sealing connection with annular seal ring. 4,407,516., Cl. 277-206.00R.

Le Blanc, Louis H., Jr., to Joy Manufacturing Company. Pneumatic motor. 4,407,390., Cl. 181-230.000.

Lecomte, Jeanne-Marie: *See*—
Roques, Bernard; and Lecomte, Jeanne-Marie, 4,407,794., Cl. 424-177.000.

Ledbetter, Buford B. Apparatus for cutting and/or scribing circles and ovals. 4,407,074., Cl. 33-27.00H.

Ledermann GmbH & Co.: *See*—
Storzer, Josef, 4,407,178., Cl. 83-835.000.

Lee, Garland G., to General Electric Company. Compositions comprising thermoplastic resin, mold release agent and long chained fatty acid. 4,408,000., Cl. 524-315.000.

Lee, Harry W., Jr.: *See*—
Jensen, Eric L.; and Lee, Harry W., Jr., 4,407,340., Cl. 141-67.000.

Lee, Lieng-Huang; and Landry, Deborah N., to Xerox Corporation. Silicone ammonium salts and photoresponsive devices containing same. 4,407,920., Cl. 430-59.000.

Lee, Minyoung; and Szala, Lawrence E., to General Electric Company. Ceramic Al_2O_3 substoichiometric TiC body. 4,407,968., Cl. 501-87.000.

Lee, Shy-Fuh, to Zoecon Corporation. Phenoxy unsaturated carboxylic acid esters and derivatives. 4,408,076., Cl. 568-325.000.

Leesona Corporation: *See*—
Brouwer, Charles W., 4,407,334., Cl. 139-435.000.

Lefebvre, Jacques: *See*—
Ladet, Michel; Lefebvre, Jacques; and Patrie, Jos, 4,408,110., Cl. 200-263.000.

Lefrancois, Philip A.: *See*—
Ulmer, Harry E.; Pickens, Donald; Rahl, Forrest J.; and Lefrancois, Philip A., 4,407,783., Cl. 423-347.000.

Leibfried, Robert W.: *See*—
Allen, Hanceford L.; Berry, William W.; and Leibfried, Robert W., 4,407,725., Cl. 502-25.000.

Leithauser, Horst: *See*—
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,407,977., Cl. 521-56.000.

Le-Khac, Bi, to Atlantic Richfield Company. Polyblend of styrene copolymers and molded article produced therefrom. 4,408,010., Cl. 525-73.000.

Lem Products, Inc.: *See*—
Trautlein, Ray W., 4,407,524., Cl. 282-9.00R.

Lenard, Peter: *See*—
Beck, Ernst; and Lenard, Peter, 4,407,172., Cl. 76-112.000.

Lenhart, Richard: *See*—
Kostner, Armin; Lenhart, Richard; and Bittner, Klaus-Jurgen, 4,407,339., Cl. 141-10.000.

Lenke, Dieter: *See*—
Eilingsfeld, Heinz; Neumann, Peter; Seybold, Guenther; Lenke, Dieter; and Friedrich, Ludwig, 4,407,810., Cl. 424-270.000.

Le Noane, Georges; and Boscher, Daniel. Method and apparatus for fabricating optical fibers. 4,407,667., Cl. 65-3.110.

Lentz, David J.; and Houghton, Richard B., to Critikon. Connector for thermodilution catheter. 4,407,298., Cl. 128-713.000.

Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselskab): *See*—
Godtfredsen, Wagn O.; and von Daehne, Welf, 4,407,751., Cl. 260-239.100.
Leppard, David G.: *See*—
Fryberg, Mario; and Leppard, David G., 4,407,935., Cl. 430-487.000.
Leppavuori, Seppo: *See*—
Rapeli, Juha; and Leppavuori, Seppo, 4,408,170., Cl. 333-172.000.
Les Fabriques d'Assortiments Reunies S.A.: *See*—
Wirz, Gustav; and Pizzagalli, Franco, 4,407,262., Cl. 125-13.00R.
Leveque, Alain: *See*—
Foraison, Dominique; and Leveque, Alain, 4,407,780., Cl. 423-10.000.
Lever Brothers Company: *See*—
Davies, James F.; and Tune, John B., 4,407,722., Cl. 252-91.000.
Levine, Jules D., to Texas Instruments Incorporated. Large area, fault tolerant solar energy converter. 4,407,320., Cl. 136-250.000.
Lewis, Barry J.: *See*—
Smith, Graydon E.; and Lewis, Barry J., 4,407,878., Cl. 428-119.000.
Lewis, Jeffrey M.: *See*—
Morin, Robert W.; Lewis, Jeffrey M.; and Bobrycki, Richard, 4,407,223., Cl. 118-212.000.
Leybold-Heraeus GmbH: *See*—
Wanetzky, Erwin; Hugo, Franz; and Kuhlmann, Fernand, 4,407,488., Cl. 266-148.000.
Li, Ming K., to General Electric Company. Purification of bisphenol-A. 4,408,087., Cl. 568-724.000.
Liang, George P., to United Technologies Corporation. Airfoil pedestaled trailing edge region cooling configuration. 4,407,632., Cl. 416-97.00R.
Licentia Patent-Verwaltungs-GmbH: *See*—
Maurer, Robert; Blum, Alfons; and Hoffmann, Michael, 4,408,351., Cl. 455-260.000.
Meyerhoff, Klaus, 4,407,465., Cl. 244-3.160.
Wahl, Helmut; and Hofmeister, Hagen, 4,408,327., Cl. 371-47.000.
Lichtenberg, Heinz D., to Dresser Industries, Inc. Apparatus for measuring the diameter of a borehole. 4,407,157., Cl. 73-151.000.
Lieber, Clement E.; Cooper, Robert P.; and Estes, Michael S., to American Hospital Supply Corporation. Method of mounting an electrical lead in a catheter body. 4,407,304., Cl. 128-786.000.
Liebman, Alan J., to Xerox Corporation. Process for developing electrostatic images with magnetic toner. 4,407,925., Cl. 430-122.000.
Liedtke, Christa: *See*—
Schwarz, Rudolf; Kleinschmit, Peter; Liedtke, Christa; and Wolff, Siegfried, 4,408,064., Cl. 556-427.000.
Lieffers, William C.; and Hatter, Marjorie M., to Union Oil Company of California. Method for gas capping of idle geothermal steam wells. 4,407,366., Cl. 166-250.000.
Life Industries Corporation: *See*—
Maggi, Richard D., 4,407,741., Cl. 252-542.000.
Lim, Franklin, to Damon Corporation. Reversible microencapsulation of a core material. 4,407,957., Cl. 435-178.000.
Lima Electric Co., Inc., The: *See*—
Szippl, Andrew F.; and Walker, Robert B., 4,408,152., Cl. 322-29.000.
Limberg, Elmar: *See*—
Gutbier, Heinrich; Strasser, Karl; Limberg, Elmar; and Jensen, Volker, 4,407,903., Cl. 429-23.000.
Lindbert, Brook A., to General Motors Corporation. Control system for split axle drive mechanism. 4,407,387., Cl. 180-247.000.
Lindbloom, George G.: *See*—
Cerutti, Henry P.; Cannon, Robert A.; and Lindbloom, George G., 4,407,609., Cl. 405-146.000.
Linden, Hans W.: *See*—
Blank, Heinz U.; Behre, Horst; Linden, Hans W.; and Mentzel, Werner, 4,407,762., Cl. 260-508.000.
Lindqvist, Albert. Modularized pneumatic tractor with debris liquefier. 4,407,035., Cl. 15-3.000.
Lingafelter, Jerry K.: *See*—
Willis, Clyde A.; and Lingafelter, Jerry K., 4,407,373., Cl. 173-141.000.
Linguenheld, Louis: *See*—
Soula, Gerard; and Linguenheld, Louis, 4,408,075., Cl. 564-474.000.
Linick, James. Steering mechanism for a thermal imaging system and rangefinder therefor. 4,407,464., Cl. 244-3.130.
Link, Helmut: *See*—
Bernauer, Karl; Link, Helmut; and Stohler, Harro, 4,407,814., Cl. 424-273.00R.
Link, Helmut F., to Index-Werke KG Hahn & Tessky. Feeding device for barstock on turning machines and the like. 4,407,176., Cl. 82-2.500.
Link, Manfred, to Triumph-Adler A.G. fur Buround Informationstechnik. Error correcting typewriter ribbon system. 4,407,594., Cl. 400-212.000.
Links, Heins: *See*—
Eheim, Franz; Hofer, Gerald; and Links, Heins, 4,407,250., Cl. 123-450.000.
Lionelle, Joseph E.; and Staffa, Jeffrey A., to Bio-Systems Research, Inc. Anti viral, anti bacterial and/or anti fungal composition containing metal oxyalkylate. 4,407,818., Cl. 424-289.000.
Lipkin, Semen I.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.
Lippe, Frank; Ottenhof, Henricus A. W. E. M.; and De Boer, Rudolf, to Stichting Nederlands Instituut Voor Zuivelonderzoek (NIZO). Continuous method for dissolving milk proteins containing casein and an apparatus for performing the method as well as water soluble milk protein products of a novel type. 4,407,747., Cl. 260-120.000.
Lippman, Lawrence G.: *See*—
Gunzberg, Guy W.; and Lippman, Lawrence G., 4,408,291., Cl. 364-900.000.
Liu, Hon. Stereoscopic photography. 4,407,575., Cl. 354-115.000.
Lockard, Joseph L., to AMP Incorporated. Cam actuated DIP test socket. 4,407,555., Cl. 339-75.00M.
Lockey, David J.: *See*—
d'Alayer de Costemore d'Arc, Stephane M.; and Lockey, David J., 4,408,335., Cl. 377-18.000.
Lockheed Missiles & Space Co., Inc.: *See*—
Rosenberg, William J.; and Title, Alan M., 4,407,566., Cl. 350-404.000.
Loder, Harry A.; and Mathna, Charles A., to Minnesota Mining & Manufacturing Co. Fade-resistant and abrasion resistant photographic reproduction, method of preparing, and photographic product therefor. 4,407,932., Cl. 430-256.000.
Lofling, Tommy: *See*—
Nilsson, Lars-Erik; and Lofling, Tommy, 4,407,073., Cl. 33-203.180.
Lommerzheim, Werner: *See*—
Flockenhaus, Claus; Hackler, Erich; and Lommerzheim, Werner, 4,407,974., Cl. 518-711.000.
Lonati, Fra esco, to Lonati S.p.A. Knitwork drawing device in a double cylinder circular knitting machine. 4,407,145., Cl. 66-14.000.
Lonati S.p.A.: *See*—
Lonati, Francesco, 4,407,145., Cl. 66-14.000.
Long, Jacques, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Electrically-driven rotary vane pump. 4,407,641., Cl. 417-356.000.
Long, John V.: *See*—
Gagliani, John; and Long, John V., 4,407,980., Cl. 521-99.000.
L'Oreal: *See*—
Gueret, Jean-Louis H., 4,407,311., Cl. 132-88.500.
Louie, Henry: *See*—
Youdin, Myron; Clagnaz, Mario W., Jr.; and Louie, Henry, 4,407,393., Cl. 188-2.00F.
Lovelace, Alan M.; and Wood, Kenneth E., to United States of America, National Aeronautics and Space Administration. Apparatus for accurately preloading auger attachment means for frangible protective material. 4,407,165., Cl. 73-862.540.
Lowe, Henry E. Animal measuring apparatus. 4,407,070., Cl. 33-169.00R.
Lowe, Ted: *See*—
Dilliner, Monte M., 4,407,252., Cl. 123-504.000.
Lowery, Kirby, Jr.: *See*—
Shipley, Randall S.; Lowery, Kirby, Jr.; and Gibbs, Ronald L., 4,408,025., Cl. 526-119.000.
Lowry, Alan, to Hartzell Manufacturing, Inc. Storage box. 4,407,411., Cl. 206-387.000.
Lucas Industries Limited: *See*—
Brotherston, Colin P.; and Adey, Anthony J., 4,407,644., Cl. 417-462.000.
Brown, David J., 4,407,915., Cl. 429-217.000.
Burrage, Robert G., 4,407,118., Cl. 60-39.281.
Edwards, Roy E., 4,407,547., Cl. 303-6.00A.
Ludlow Corporation: *See*—
McCorkle, James, 4,407,443., Cl. 383-5.000.
Lukes, Henry J., to Sundstrand Data Control, Inc. Tape tension control for a tape transducer. 4,408,144., Cl. 318-7.000.
Luks, Daniel W., to Frenchtown American Corp. Method for producing spheroidal ceramics. 4,407,967., Cl. 501-81.000.
Lukyanov, Anatoly A.: *See*—
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.
Lumma, William C., Jr.: *See*—
Baldwin, John J.; and Lumma, William C., Jr., 4,408,047., Cl. 544-250.000.
Lummus Industries, Inc.: *See*—
Van Doorn, Donald W.; Webb, Tommy W.; and Hawkins, James B., 4,407,047., Cl. 19-64.500.
Lumpkin, Steven B. Two-wire exchange telephone system. 4,408,102., Cl. 179-99.00H.
Lundgren, Bengt, to SKF Nova AB. Friction joint. 4,407,603., Cl. 403-370.000.
Lundstrom, Eric A., to United States of America, Navy. Waveplate for correcting thermally induced stress birefringence in solid state lasers. 4,408,334., Cl. 372-98.000.
Lyon, Lyndall W.; Reneau, Phillip G.; and Coppock, Paul G., to Citation-Walther Corporation, The. Marking means for hose coupling expansion attachment machine. 4,407,192., Cl. 101-7.000.
Lyons, Leon W. Archery bowstring release device. 4,407,260., Cl. 124-35.00A.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Simeth, Claus, 4,407,198., Cl. 101-248.000.
M. W. Kellogg Company, The: *See*—
van Dijk, Christiaan P.; Solbakken, Aage; and Rovner, Jerry M., 4,407,973., Cl. 518-703.000.

M. Wile & Company, Inc.: *See*—
Gunzberg, Guy W.; and Lippman, Lawrence G., 4,408,291., Cl. 364-900.000.

Ma, Bing C.: *See*—
Han, Yu-Pin; and Ma, Bing C., 4,407,696., Cl. 156-653.000.

MAC Valves, Inc.: *See*—
Neff, James A., 4,407,323., Cl. 137-454.200.

Macbeth, William B., Jr.: *See*—
Davis, Richard L.; Graf, Harlan G.; Edwards, Don L.; and Macbeth, William B., Jr., 4,407,700., Cl. 202-85.000.

MacDermott, Carl H.; and Brown, Richard S., Jr., to Rains, Louis; and Smith, Arthur Albert, Jr. Illuminated spirit vial and level. 4,407,075., Cl. 33-348.200.

MacGregor, Clive D. R.; and Forsyth, William G., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Absorption of carbon dioxide. 4,407,723., Cl. 252-192.000.

Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senco, Keizi, to Japan Atomic Energy Research Institute; and Yuasa Battery Co., Ltd. Method of producing a hydrophilic membrane from a polyethylene base film. 4,407,846., Cl. 427-35.000.

MacPherson, William F.: *See*—
Bulley, Raymond M.; MacPherson, William F.; and Youhas, Robert F., 4,408,248., Cl. 361-91.000.

Maeda, Yukio: *See*—
Inoue, Takao; Wakahata, Tamotsu; Momose, Keigo; and Maeda, Yukio, 4,407,914., Cl. 429-174.000.

Maekawa, Kouzi: *See*—
Miyakawa, Nobuhiro; Fujii, Masanori; Maekawa, Kouzi; Koyama, Haruo; and Teshima, Takashi, 4,407,923., Cl. 430-106.600.

Maekawa, Yukio: *See*—
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Magdon, John: *See*—
Haardt, Henry; Magdon, John; and Noble, Eric, 4,407,766., Cl. 264-2.200.

Maggi, Richard D., to Life Industries Corporation. Hydrotropic cleaner. 4,407,741., Cl. 252-542.000.

Maglio, Murrill: *See*—
Moore, Stephen D.; and Maglio, Murrill, 4,407,322., Cl. 137-268.000.

Maglio, Ralph A., to Firestone Tire & Rubber Company, The. Method of producing a contoured disk wheel. 4,407,772., Cl. 264-294.000.

Mahony, John E., to General Electric Company. Method and means for reducing noise in television display system. 4,408,228., Cl. 358-167.000.

Maier, Bruce R.: *See*—
Ogawa, Kenji, 4,408,241., Cl. 360-128.000.

Malick, Howard M.: *See*—
Ferguson, Andrew M.; and Malick, Howard M., 4,407,832., Cl. 426-281.000.

Malizio, Andrew B., to United States Pipe and Foundry Company. Polyolefin coating containing an ionomer for metal substrates. 4,407,893., Cl. 428-454.000.

Mallon, Charles B., to Union Carbide Corporation. Co-condensates of alkyl silicates and alkoxy silanes. 4,408,009., Cl. 524-858.000.

Mallory, Glenn O.; and Horhn, Theresa R., to Richardson Chemical Company. Controlling boron content of electroless nickel-boron deposits. 4,407,869., Cl. 427-443.100.

Malykh, Vladimir A.: *See*—
Chegolya, Alexandr S.; Malykh, Vladimir A.; Chizhov, Vladimir V.; Yankov, Viktor I.; and Pirog, Nikolai I., 4,407,450., Cl. 239-8.000.

Mamzelev, Viktor A.: *See*—
Artemenko, Vladimir I.; Belikov, Viktor T.; Ivlev, Anatoly D.; and Mamzelev, Viktor A., 4,408,145., Cl. 318-135.000.

Mankey, Harry S.: *See*—
Oswald, Norman D.; and Mankey, Harry S., 4,407,381., Cl. 180-6.480.

Mann, Donald B. Pivotally mounted ripping teeth assembly on dozer blade. 4,407,080., Cl. 37-117.500.

Manning, Clyde L.: *See*—
Bushaw, Kenneth A.; Gillingham, Ronald D.; Jorgenson, Gary W.; Manning, Clyde L.; and Steffes, Michael A., 4,408,231., Cl. 358-280.000.

Manning, John J., to Mesa Technology. Semiconductor die bonding machine. 4,407,440., Cl. 228-6.00A.

Manzonelli, Carmen C.; and Chatfield, David A., to National Steel Corporation. Method of producing high tensile aluminum-magnesium alloy sheet and the products so obtained. 4,407,679., Cl. 148-2.000.

Marcamor, Inc.: *See*—
Brodbeck, Robert M., 4,408,101., Cl. 179-90.0BD.

Marchenkov, Nikolai B.: *See*—
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.

Margolis, Geoffrey: *See*—
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Mariaulle, Dominique: *See*—
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Marko, Ollie W., to Dow Corning Corporation. Waste chlorosilane treatment. 4,408,030., Cl. 528-10.000.

Markusch, Peter, to Mobay Chemical Corporation. Stable, colloidal, aqueous dispersions of cross-linked urea-urethane polymers and their method of production. 4,408,008., Cl. 524-591.000.

Martin, John H. E. J.: *See*—
Labeda, David P.; Martin, John H. E. J.; and Goodman, Joseph J., 4,407,946., Cl. 435-75.000.

Martin Marietta Corporation: *See*—
Wills, Milton H., Jr., 4,407,677., Cl. 106-97.000.

Martin, Michael K., to Shell Oil Company. Coupling process. 4,408,017., Cl. 525-288.000.

Martinovich, Robert J.: *See*—
Garcia, Rodrigo A.; Moreno, Roel; and Martinovich, Robert J., 4,407,768., Cl. 264-54.000.

Martinsons, Dainis O.: *See*—
Benton, Robert L.; Martinsons, Dainis O.; and Stimpson, Flave F., 4,407,511., Cl. 277-24.000.

Maruyama, Hideki: *See*—
Izumi, Masao; Maruyama, Hideki; and Yoshida, Hiroshi, 4,407,186., Cl. 98-2.000.

Maruyama, Teruo, to Matsushita Electric Industrial Co., Ltd. Compressor. 4,407,639., Cl. 417-292.000.

Marzolph, Gerhard: *See*—
Schmidt, Thomas; Timmler, Helmut; Bonse, Gerhard; Blank, Heinz U.; and Marzolph, Gerhard, 4,408,044., Cl. 544-182.000.

Masaki, Kenji, to Nissan Motor Co., Ltd. Closed loop type air-fuel ratio control system of an internal combustion engine. 4,407,247., Cl. 123-438.000.

Mase, Syunzo; and Soejima, Shigeo, to NGK Insulators, Ltd. Oxygen concentration detector and a method of detecting oxygen concentration. 4,407,704., Cl. 204-1.00T.

Mashita, Kentaro: *See*—
Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, 4,408,086., Cl. 568-719.000.

Mashuda, David. Mechanized wheelchair. 4,407,543., Cl. 297-330.000.

Maslov, Gennady N.: *See*—
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.

Masserang, Gregory J.: *See*—
Rise, William E.; and Masserang, Gregory J., 4,407,404., Cl. 198-774.000.

Massey, Billy G., to Whitmire Research Laboratories, Inc. Spray system. 4,407,454., Cl. 239-154.000.

Massey-Ferguson-Perkins Limited: *See*—
Blum, Alfred E. G., 4,407,242., Cl. 123-188.00S.

MasterCard International, Inc.: *See*—
Campbell, Carl M., 4,408,203., Cl. 340-825.340.

Masters, William E. Frame system for kayak. 4,407,216., Cl. 114-347.000.

Masuda, Mitsuya: *See*—
Inohara, Shizuo; Masuda, Mitsuya; Iyehara, Sadahiro; Ueda, Minoru; and Yamamoto, Keisuke, 4,408,143., Cl. 315-366.000.

Masuda, Tatsuo: *See*—
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,407,383., Cl. 180-54.00E.

Masuda, Toshiyuki, to Matsushita Denko Kabushiki Kaisha. Circuit for remotely operating an electromagnetic relay. 4,408,250., Cl. 361-160.000.

Matalia, Harshad D.; and Navi, Menashe, to American Newspaper Publishers Association. Method of enhancing inking in offset presses. 4,407,196., Cl. 101-142.000.

Matejka, Zdenek: *See*—
Kahovec, Jaroslav; Matejka, Zdenek; and Tomasek, Josef, 4,407,978., Cl. 521-56.000.

Mathna, Charles A.: *See*—
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Matner, Martin: *See*—
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Matson, Stephen L.: *See*—
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Matsuda, Shimpei: *See*—
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.

Matsumura, Akira, to Nissan Motor Company, Limited. Communications system for automotive vehicles. 4,408,179., Cl. 340-32.000.

Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, to Sumitomo Chemical Company, Limited. Oligomerization of m-isopropenylphenol. 4,408,086., Cl. 568-719.000.

Matsushita Denko Kabushiki Kaisha: *See*—
Masuda, Toshiyuki, 4,408,250., Cl. 361-160.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
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Inoue, Takao; Wakahata, Tamotsu; Momose, Keigo; and Maeda, Yukio, 4,407,914., Cl. 429-174.000.

Kobayashi, Hiroyuki; Ohki, Yoshimasa; Toyoda, Yukio; and Akasaki, Isamu, 4,408,217., Cl. 357-17.000.
Maruyama, Teruo, 4,407,639., Cl. 417-292.000.
Muranaka, Takayoshi; and Mori, Hajime, 4,408,259., Cl. 361-434.000.
Murata, Shigeki; Kajino, Jirou; and Minabe, Hitoshi, 4,408,236., Cl. 360-85.000.
Nishino, Atsushi; Suzuki, Tadashi; Ikeda, Masaki; and Ohtani, Tadashi, 4,408,253., Cl. 361-293.000.
Takeyama, Kojiro; and Shimotake, Toru, 4,407,078., Cl. 34-133.000.
Watanabe, Masayuki; Yamaya, Hiroshi; and Kurohata, Hitoshi, 4,407,552., Cl. 339-143.00R.

Matsuyama, Kiyoshi; and Hashimoto, Hitoshi, to Sumitomo Chemical Co., Ltd. Method for the heat removal from polymerization reactor. 4,408,024., Cl. 526-67.000.

Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., to Bernard Matthews Limited. Method of making a fat coated meat product. 4,407,830., Cl. 426-272.000.

Matthews, David W.: *See*—
Chadwick, Henry D.; and Matthews, David W., 4,408,322., Cl. 370-17.000.

Matzkanin, George A.: *See*—
King, James D.; Burkhardt, Gary L.; Barton, John R.; and Matzkanin, George A., 4,408,160., Cl. 324-209.000.

Mauranen, Pekka, to Valmet Oy. Surface sizing and coating apparatus for a paper web of a paper machine. 4,407,227., Cl. 118-642.000.

Maurer, Fritz: *See*—
Forster, Heinz; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,408,055., Cl. 548-125.000.

Maurer, Robert; Blum, Alfons; and Hoffmann, Michael, to Licentia Patent-Verwaltungs-GmbH. Directly mixing receiving system. 4,408,351., Cl. 455-260.000.

Maxwell Products, Inc.: *See*—
Elliott, Franklin E., 4,407,030., Cl. 5-66.000.

Mayer, Rolf: *See*—
Schlegel, Hans; Nowotny, Theodor; and Mayer, Rolf, 4,407,875., Cl. 428-43.000.

Mazur, Robert H.; Tyner, David A.; and Hallinan, Eleanor A., to G. D. Searle & Co. Cyclohexyl and phenyl substituted enkephalins. 4,407,746., Cl. 260-112.50E.

McBride, Joseph R., to Bridges Electric, Inc. Fault detector with improved response time for electrical transmission system. 4,408,155., Cl. 324-51.000.

McCambridge, Joseph. Fluid dynamic erosion control unit. 4,407,607., Cl. 405-26.000.

McCandless, Thomas J.: *See*—
Wilde, Sheldon L.; McCandless, Thomas J.; and Saunders, Robert M., 4,407,422., Cl. 215-246.000.

McCarthy, Edward F.: *See*—
Weisrock, William P.; and McCarthy, Edward F., 4,407,950., Cl. 435-104.000.
Weisrock, William P.; and McCarthy, Edward F., 4,407,951., Cl. 435-104.000.

McClellan, Gary C. Diffusion apparatus for gated irrigation pipes. 4,407,453., Cl. 239-145.000.

McClure, David E.: *See*—
Baldwin, John J.; and McClure, David E., 4,408,063., Cl. 549-518.000.

McCollum, Anthony W.: *See*—
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,408,029., Cl. 526-321.000.

McCorkle, James, to Ludlow Corporation. Tamper-indicating sheet. 4,407,443., Cl. 383-5.000.

McCormick, Dennis L. Hydraulically actuated railway car dumping system. 4,407,202., Cl. 105-271.000.

McCoy, Reginald F. H. Television chroma-key systems. 4,408,221., Cl. 358-22.000.

McFarland, James G. Hair styling method. 4,407,309., Cl. 132-45.00R.

McGowan, Malcolm S.: *See*—
East, Phillip C.; and McGowan, Malcolm S., 4,408,164., Cl. 328-117.000.

McGraw-Edison Company: *See*—
Kusmer, Raymond J., 4,408,262., Cl. 362-147.000.
Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarance R., 4,407,697., Cl. 162-137.000.

McIlwain, Irwin D.; and Halls, Lawrence M., to Sperry Corporation. Frame for crop harvesting header. 4,407,110., Cl. 56-14.400.

McIlwain, John F.: *See*—
Holman, James L., Jr.; McIlwain, John F.; and Neumeier, L. A., 4,407,775., Cl. 419-36.000.

McKeon, John F.: *See*—
Tullis, Barclay J.; Tan, Randy J.; and McKeon, John F., 4,408,195., Cl. 340-685.000.

McLaren, Edwin C.; and Adamek, David J., to Champion International Corporation. Round ice cream carton lid. 4,407,426., Cl. 220-306.000.

McLaughlin, James A., to Titanseal Corporation. Window. 4,407,099., Cl. 52-202.000.

McWaters, Lynn D.; and Sanner, Medford D., to Recognition Equipment Incorporated. OCR and Bar code reader using multi port matrix array. 4,408,344., Cl. 382-62.000.

Meckel, Joachim: *See*—
Flockenhaus, Claus; Wagener, Dietrich; Hackler, Erich; Smieskol, Stefan; Galow, Manfred; Meckel, Joachim; and Breidenbach, Dieter, 4,407,699., Cl. 201-39.000.

Medical Designs, Inc.: *See*—
Bledsoe, Gary R., 4,407,276., Cl. 128-80.00C.

Medtek Corporation: *See*—
Croslin, Michael E., 4,407,297., Cl. 128-681.000.

Medtronic, Inc.: *See*—
Anderson, Kenneth M., 4,407,296., Cl. 128-675.000.
Herpers, Lodewijk-Jozef, 4,407,287., Cl. 28-419.0PG.

Mehrotra, Gopi N.; and Van Arsdall, Gerald, to RCA Corporation. Video disc player having stylus cleaning apparatus. 4,408,315., Cl. 369-71.000.

Meinan Machinery Works, Inc.: *See*—
Hasegawa, Kaisuji, 4,407,345., Cl. 144-211.000.

Meinco Mfg. Co.: *See*—
Meinzer, Jan N., 4,407,484., Cl. 256-13.100.

Meinzer, Jan N., to Meinco Mfg. Co. Impact energy absorber. 4,407,484., Cl. 256-13.100.

Mele, John J.: *See*—
Fleming, Rebecca P.; Lawhorne, Samuel, Jr.; Mele, John J.; and Prasad, Chandrika, 4,407,860., Cl. 427-98.000.

Melliger, Guido W., to Melliger, Guido W. Coating process. 4,407,844., Cl. 427-3.000.

Mendy, Francois, to Roussel UCLAF. Lipidic compositions for use in dietetics, reanimation and therapeutics. 4,407,821., Cl. 424-312.000.

Menen, Balan R. Counterweight system for positive displacement piston type device. 4,407,169., Cl. 74-604.000.

Mentzel, Werner: *See*—
Blank, Heinz U.; Behre, Horst; Linden, Hans W.; and Mentzel, Werner, 4,407,762., Cl. 260-508.000.

Merchant, Philip, Jr.; and Smith, Dean L., Jr., to Exxon Research and Engineering Co. Process for dedusting solids-containing hydrocarbon oils. 4,407,706., Cl. 204-190.000.

Merchant, Philip, Jr.; and Smith, Dean L., Jr., to Exxon Research and Engineering Co. Process for dedusting solids-containing hydrocarbon oils. 4,407,707., Cl. 204-190.000.

Merck & Co., Inc.: *See*—
Baldwin, John J.; and Lumma, William C., Jr., 4,408,047., Cl. 544-250.000.
Baldwin, John J.; and McClure, David E., 4,408,063., Cl. 549-518.000.
Graham, Donald W.; Rasmusson, Gary H.; and Tolman, Richard L., 4,407,802., Cl. 424-253.000.
Kniskern, Peter J.; Hagopian, Arpi; and Carlo, Dennis J., 4,407,949., Cl. 435-101.000.

Merger, Franz; and Foerster, Hans-Juergen, to BASF Aktiengesellschaft. Preparation of alpha-alkylacroleins. 4,408,079., Cl. 568-463.000.

Merritt, John H., Jr., to Applied Engineering Co., Inc. Economizer with soot blower. 4,407,237., Cl. 122-390.000.

Merz, Jurg; Wegmuller, Hans; and Wurster, Rudolf F., to Ciba-Geigy Corporation. Anionic adsorbent. 4,407,976., Cl. 521-36.000.

Mesa Technology: *See*—
Manning, John J., 4,407,440., Cl. 228-6.00A.

Messerschmitt Boelkow Blohm Gesellschaft mit Beschraenkter Haftung: *See*—
Born, Gunthard; and Altmann, Konrad, 4,407,452., Cl. 239-132.500.
Regnat, Karl, 4,407,180., Cl. 89-1.50B.

Messick, Virginia B., to Dow Chemical Company, The. Oxalic acid stabilized thermosettable vinyl ester resins. 4,407,991., Cl. 524-83.000.

Metatech Corporation: *See*—
Perlin, Alfred R., 4,407,285., Cl. 128-325.000.

Metz, Ramey B. Traffic signal light intensity control. 4,408,180., Cl. 340-40.000.

Meuzelaar, Hendrik L. C., to University of Utah. Modular pyrolysis inlet and method for pyrolyzing compounds for analysis by mass spectrometer. 4,408,125., Cl. 250-288.000.

Meyborg, Holger: *See*—
Salzburg, Herbert; Meyborg, Holger; and Ziemann, Heinz, 4,408,061., Cl. 549-464.000.

Meyer, Daniel, to Communications Systems, Inc. Connector device with flush mounting receptacle, cover plate and terminal board. 4,407,559., Cl. 339-126.00R.

Meyer, Horst, to Kochs Adler AG. Template for topstitching joined workpiece parts. 4,407,208., Cl. 112-121.120.

Meyerhoff, Klaus, to Licentia Patent-Verwaltungs-GmbH. Method for guiding missiles. 4,407,465., Cl. 244-3.160.

Michelet, Guy A.; and Bret, Georges G., to Quantel S.A. Objective having a variable focal length. 4,407,567., Cl. 350-423.000.

Michiels, August. Elastomer mattress with stiffener elements. 4,407,031., Cl. 5-462.000.

Microcomputer Systems, Inc.: *See*—
Gilovich, Paul A.; and Toreson, James S., 4,408,317., Cl. 360-74.300.

Microlife Technics, Inc.: *See*—
Raccach, Moshe, 4,407,828., Cl. 426-56.000.

Midland, Richard W., to Zenith Radio Corporation. Beam index color display system. 4,408,223., Cl. 358-67.000.

Midwest Computer Register Corp.: *See*—
Salvesen, Richard S., 4,408,204., Cl. 340-870.240.

Miedel, Roland E. Tent construction having illuminating means. 4,408,260., Cl. 362-32.000.

Milberger, Lionel J.; Horn, Charles E.; and Kluttz, Marvin H., to FMC Corporation. Method and apparatus for hydraulically controlling subsea equipment. 4,407,183., Cl. 91-1.000.

Milkovich, Ralph; and Warfel, David R., to Atlantic Richfield Company. Star elastomers in footwear compounds. 4,408,006., Cl. 524-534.000.

Millen, Theodore I., to Georgian Manufacturing Ltd. Wave responsive swimming pool alarm. 4,408,193., Cl. 340-566.000.
Miller, Donald E.: *See—*
Rule, Charles E.; and Miller, Donald E., 4,407,838., Cl. 426-602.000.
Miller, Franklyn D.: *See—*
Muller, Werner C.; and Miller, Franklyn D., 4,407,955., Cl. 435-161.000.
Miller, Gerald R.: *See—*
Virkar, Anil V.; and Miller, Gerald R., 4,407,912., Cl. 429-104.000.
Miller, Glenn E.: *See—*
Latimer, John P.; and Miller, Glenn E., 4,407,716., Cl. 210-155.000.
Miller, Joseph A. Fishing rod holder. 4,407,089., Cl. 43-21.200.
Miller, Robert R. Mobile unit support. 4,407,103., Cl. 52-292.000.
Millipore Corporation: *See—*
Abrahams, Louis; and Izod, Thomas P. J., 4,407,988., Cl. 523-334.000.
Cole, Francis X.; and Van Voorhis, Deborah M., 4,407,943., Cl. 435-7.000.
Mills, Gary L.; and Bowen, B. Dean, to Teledyne Industries, Inc. Method and apparatus of hot working metal with induction reheating. 4,407,486., Cl. 266-87.000.
Minabe, Hitoshi: *See—*
Murata, Shigeki; Kajino, Jirou; and Minabe, Hitoshi, 4,408,236., Cl. 360-85.000.
Minemura, Norihiro: *See—*
Yamaguchi, Taturo; and Minemura, Norihiro, 4,407,848., Cl. 427-36.000.
Miner, Thomas G.; and Bernstein, Seymour, to American Cyanamid Company. Modulators of the complement system. 4,407,796., Cl. 424-180.000.
Mining Supplies Limited: *See—*
Stoppani, Brian R., 4,407,545., Cl. 299-30.000.
Ministry of International Trade and Industry: *See—*
Furuya, Setsuko; Ohnishi, Shunji; and Kato, Masao, 4,408,012., Cl. 525-161.000.
Koda, Yoshio, 4,407,655., Cl. 434-219.000.
Minnesota Mining & Manufacturing Co.: *See—*
Loder, Harry A.; and Mathna, Charles A., 4,407,932., Cl. 430-256.000.
Minolta Camera Kabushiki Kaisha: *See—*
Kondo, Takashi; and Hashimoto, Nobuo, 4,408,288., Cl. 364-525.000.
Nakamura, Ikushi, 4,407,577., Cl. 354-173.000.
Minott, Peter O., to United States of America, National Aeronautics and Space Administration. High speed multi focal plane optical system. 4,407,563., Cl. 350-173.000.
Mirowski, Mieczyslaw: *See—*
Langer, Alois A.; Kolenik, Steve A.; Heilman, Marlin S.; Mirowski, Mieczyslaw; and Mower, Morton M., 4,407,288., Cl. 128-419.0PG.
Mirtain, Henri J., to Pneu Uniroyal Englebert. Pneumatic tire. 4,407,347., Cl. 152-361.0FP.
Misawa Home Co., Ltd.: *See—*
Kataishi, Takao; and Yokoi, Nobufumi, 4,407,225., Cl. 118-425.000.
Mita Industrial Co., Ltd.: *See—*
Miyakawa, Nobuhiro; Fujii, Masanori; Maekawa, Kouzi; Koyama, Haruo; and Teshima, Takashi, 4,407,923., Cl. 430-106.600.
Mitchell, Hal D.: *See—*
Kralik, Douglas R.; and Mitchell, Hal D., 4,407,021., Cl. 2-416.000.
Mitchell, Mark L., III; and Carr, Richard P., to Sherwin-Williams Company, The. Preparation of ortho-sulfobenzoic acid anhydride by catalyzed thermolysis. 4,408,058., Cl. 549-33.000.
Mitchell, Winalee G. Method of manufacturing cover for stirrup of physician's examination table. 4,407,687., Cl. 156-227.000.
Mitsubishi Chemical Industries Ltd.: *See—*
Fushiki, Takeshi; Tagawa, Tohru; and Kawakami, Satoru, 4,407,999., Cl. 524-276.000.
Murayama, Tetsuo; Otsuka, Shigenori; Tajima, Tsunemitsu; and Sato, Yukihiro, 4,407,919., Cl. 430-58.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Gas Chemical Company, Inc.: *See—*
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,408,080., Cl. 568-484.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Fujiwara, Haruyoshi, 4,407,330., Cl. 138-30.000.
Mitsubishi Paper Mills, Ltd.: *See—*
Kubbota, Masashi; and Noda, Touru, 4,407,896., Cl. 428-513.000.
Mitsubishi Rayon Co., Ltd.: *See—*
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Mitsui Petrochemical Industries, Ltd.: *See—*
Toyoura, Masakazu; Shomura, Koichi; Tsuchida, Hirotoshi; and Murakami, Tadateru, 4,408,083., Cl. 568-576.000.
Mitsui Toatsu Chemicals, Incorporated: *See—*
Yamaguchi, Akihiro; Yamaguchi, Keizaburo; and Murakami, Hisamichi, 4,407,892., Cl. 428-411.000.
Miyaka, Toshio: *See—*
Hirao, Mamoru; Hijiya, Hiromi; and Miyaka, Toshio, 4,408,041., Cl. 536-4.100.
Miyakawa, Nobuhiro; Fujii, Masanori; Maekawa, Kouzi; Koyama, Haruo; and Teshima, Takashi, to Mita Industrial Co., Ltd. One component magnetic developer. 4,407,923., Cl. 430-106.600.
Miyamura, Yoshinori: *See—*
Terao, Motoyasu; Horigome, Shinkichi; Shigematsu, Kazuo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,407,880., Cl. 428-156.000.
Miyatsuka, Hajime; Kasuga, Akira; and Yamada, Yasuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,407,901., Cl. 428-694.000.
Miyoshi, Hiroshi: *See—*
Ina, Katutoshi; Yamamoto, Kazuo; Higashiyama, Hirokichi; Ishikawa, Norio; and Miyoshi, Hiroshi, 4,407,681., Cl. 148-12.00F.
Mizukura, Noboru; and Koyama, Mikio, to Konishiroku Photo Ind. Co., Ltd. Photographic element with lactone polymer. 4,407,938., Cl. 430-533.000.
Mizukura, Noboru: *See—*
Suginaka, Shunji; Kobayashi, Ryuichiro; Ikeuchi, Satoru; Mizukura, Noboru; and Fujita, Noriko, 4,407,941., Cl. 430-566.000.
Mizuno, Masashi: *See—*
Sawa, Shigeki; Nagasaka, Hiroyasu; Saito, Makoto; Mizuno, Masashi; and Kozima, Katuhiro, 4,407,682., Cl. 148-128.000.
Mobay Chemical Corporation: *See—*
Markusch, Peter, 4,408,008., Cl. 524-591.000.
Moeller, Roy P., to Altex Scientific, Inc. Pulse width modulation decoder. 4,408,166., Cl. 329-106.000.
Moessinger, Albert. Process and device for the insertion of a weft thread into the space between two lines of warp thread. 4,407,335., Cl. 139-452.000.
Mogi, Keitaro: *See—*
Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Sakasai, Toshio; and Iguchi, Nobuyoshi, 4,407,826., Cl. 426-7.000.
Mohrman, Richard C.: *See—*
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Molitor Industries, Inc.: *See—*
Molitor, Victor D., 4,407,266., Cl. 126-299.00D.
Molitor, Victor D., to Molitor Industries, Inc. Method of and apparatus for exhaust control and supplying tempered makeup air for a grease extraction ventilator. 4,407,266., Cl. 126-299.00D.
Mollmann, Erwin. Under carriages for sliding doors having symmetrical weight distribution. 4,407,043., Cl. 16-100.000.
Molteni, Luigi: *See—*
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Monaghan, Richard C.: *See—*
Cook, Clarence E.; Smith, Glynn E.; and Monaghan, Richard C., 4,407,686., Cl. 156-215.000.
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Torbeck, Daniel J., 4,407,692., Cl. 156-350.000.
Monroe, Marvin E.: *See—*
Kavage, William T.; and Monroe, Marvin E., 4,408,295., Cl. 364-552.000.
Monsanto Company: *See—*
Schumacher, Ignatius; and Wang, Kang-Bo, 4,407,729., Cl. 502-200.000.
Seaborn, Douglas K., 4,407,767., Cl. 264-40.100.
Sikorski, James A.; and Hoobler, Mary A., 4,407,763., Cl. 260-940.000.
Sikorski, James A.; and Hoobler, Mary A., 4,407,764., Cl. 260-940.000.
Montgomery, Warren A., to Bell Telephone Laboratories, Incorporated. Processor facilities for integrated packet and voice switching. 4,408,323., Cl. 370-60.000.
Moody, Gary W. Wrist attached rattle and educational device for infants. 4,407,091., Cl. 46-193.000.
Moore, Leonard: *See—*
Furlong, Owen D.; and Moore, Leonard, 4,407,153., Cl. 73-23.000.
Moore, Prentice G.: *See—*
Brozovich, Roy S.; and Moore, Prentice G., 4,408,158., Cl. 324-78.00R.
Moore, Stephen D.; and Maglio, Murrill. Chemical feeder. 4,407,322., Cl. 137-268.000.
Moore, Susan J.: *See—*
White, Douglass A.; Moore, Susan J.; and Clark, David F., 4,408,199., Cl. 340-731.000.
Moorfeed Corporation: *See—*
Cortellini, Conrad; Boone, Jeffrey S.; and Conard, Richard D., 4,408,277., Cl. 364-300.000.
Morel, Don L.: *See—*
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Garcia, Rodrigo A.; Moreno, Roel; and Martinovich, Robert J., 4,407,768., Cl. 264-54.000.
Morgan, George R. Hot gas Stirling cycle piston engine. 4,407,123., Cl. 60-525.000.
Mori, Hajime: *See—*
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Moriguchi, Fujio; and Kurata, Masami, to Fuji Xerox Co., Ltd. Multicolor recording device. 4,408,212., Cl. 346-76.0PH.

Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, to Takeda Chemical Industries, Ltd. Aralkyl carboxylic acid compounds. 4,407,757., Cl. 260-413.000.

Morin, Robert W.; Lewis, Jeffrey M.; and Bobrycki, Richard, to Boston Machine Works Company. Contour cementing machine. 4,407,223., Cl. 118-212.000.

Morrow, Robert S.: *See*—
Sisson, Edwin D.; Morrow, Robert S.; Stoutenburg, Donn V.; and Davis, Dean T., 4,408,285., Cl. 364-508.000.

Morse, David L.: *See*—
Kerko, David J.; and Morse, David L., 4,407,966., Cl. 501-13.000.

Morton Thiokol, Inc.: *See*—
Penn, Howard I., 4,408,021., Cl. 525-440.000.

Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., to Klockner-Humboldt-Deutz AG. System for heating the service cabin of a machine operated by an internal cumbustion engine. 4,407,449., Cl. 237-12.30R.

Moskowitz, Ronald; Raj, Kuldip; and Kern, James L., to Ferrofluidics Corporation. Nonbursting multiple-stage ferrofluid seal and system. 4,407,518., Cl. 277-1.000.

Moss, Lester I., to Mosstype Corporation. Mandrel assembly for demountable printing cylinders of different lengths. 4,407,199., Cl. 101-375.000.

Moss, Theron V., to SECO Industries, Inc. Dust mop handle attachment device. 4,407,039., Cl. 15-144.00A.

Mosstype Corporation: *See*—
Moss, Lester I., 4,407,199., Cl. 101-375.000.

Most, Elmer E., Jr.: *See*—
Gintis, Daniel; and Most, Elmer E., Jr., 4,407,889., Cl. 428-398.000.

Mostek Corporation: *See*—
Guterman, Daniel C.; and Kupec, James D., 4,408,303., Cl. 365-205.000.
Han, Yu-Pin; and Ma, Bing C., 4,407,696., Cl. 156-653.000.
Kirsch, Howard C., 4,408,136., Cl. 307-475.000.
Terry, Michael B., 4,408,153., Cl. 323-224.000.

Motorola, Inc.: *See*—
Gay, Michael J., 4,408,222., Cl. 358-24.000.
Kuo, Clinton C. K., 4,408,305., Cl. 365-189.000.
Kuo, Clinton C. K., 4,408,306., Cl. 365-218.000.

Mouille, Rene L., to Societe Nationale Industrielle Aero. Helicopter rotor. 4,407,633., Cl. 416-140.000.

Moustakas, Theodore D.; Morel, Don L.; and Abeles, Benjamin, to Exxon Research and Engineering Co. Hybrid method of making an amorphous silicon P-I-N semiconductor device. 4,407,710., Cl. 204-192.00S.

Mower, Morton M.: *See*—
Langer, Alois A.; Kolenik, Steve A.; Heilman, Marlin S.; Mirowski, Mieczyslaw; and Mower, Morton M., 4,407,288., Cl. 128-419.0PG.

Muellejans, Herbert; and Koetz, Hans-Joachim, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Light-weight cross-flow heat exchanger unit. 4,407,358., Cl. 165-166.000.

Mueller, Charles P.: *See*—
Deuschle, Roger A.; and Mueller, Charles P., 4,407,672., Cl. 75-10.00R.

Mueller Co.: *See*—
Daghe, Joseph L.; and Sands, Robert E., 4,407,482., Cl. 251-148.000.

Mueller, Dale A., to Honeywell Inc. Heat pump system defrost control system with override. 4,407,138., Cl. 62-126.000.

Mueller, Wolfgang: *See*—
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,407,993., Cl. 524-96.000.
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,408,051., Cl. 546-19.000.

Mues, Volker: *See*—
Forster, Heinz; Maurer, Fritz; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,408,055., Cl. 548-125.000.

Muhr, Richard; and Schink, Karl, to Muhr und Bender. Apparatus for perforating a workpiece. 4,407,614., Cl. 408-13.000.

Muhr und Bender: *See*—
Muhr, Richard; and Schink, Karl, 4,407,614., Cl. 408-13.000.

Mukai, Hideo: *See*—
Hashimoto, Shinichi; Takano, Toshimasa; and Mukai, Hideo, 4,407,580., Cl. 355-3.0TR.
Takano, Toshimasa; Mukai, Hideo; and Hosoya, Masahiro, 4,407,228., Cl. 118-651.000.

Mukooyama, Haruhisa: *See*—
Tojo, Toru; Sugihara, Kazuyoshi; Hata, Shuntaro; Numaga, Hirooki; Mukooyama, Haruhisa; and Suzuki, Yoshio, 4,408,126., Cl. 250-442.100.

Muller, Frank A., to Scripto, Inc. Method of making and improved compositions for an initially erasable ink for a ball point writing instrument. 4,407,985., Cl. 523-161.000.

Muller, Lutz: *See*—
Junge, Bodo; Stoltefuss, Jurgen; Muller, Lutz; Krause, Hans-Peter; and Sitt, Rudiger, 4,407,809., Cl. 424-267.000.

Muller, Werner C.; and Miller, Franklyn D., to National Distillers and Chemical Corporation. Fermentable sugar from the hydrolysis of starch derived from dry milled cereal grains. 4,407,955., Cl. 435-161.000.

Mullins, Barry W.: *See*—
Voge, Andrew; Sparks, Daniel R.; and Mullins, Barry W., 4,408,252., Cl. 361-288.000.

Munch, Erich: *See*—
Kleinsorgen, Klaus; and Munch, Erich, 4,407,338., Cl. 141-1.000.

Munk, Barbara H.: *See*—
Colborn, David W.; Coyne, Thomas S.; Emrie, Carolyn P.; and Munk, Barbara H., 4,407,231., Cl. 119-1.000.

Murakami, Hisamichi: *See*—
Yamaguchi, Akihiro; Yamaguchi, Keizaburo; and Murakami, Hisamichi, 4,407,892., Cl. 428-411.000.

Murakami, Tadateru: *See*—
Toyoura, Masakazu; Shomura, Koichi; Tsuchida, Hirotoshi; and Murakami, Tadateru, 4,408,083., Cl. 568-576.000.

Muranaka, Takayoshi; and Mori, Hajime, to Matsushita Electric Industrial Company, Limited. Electrochemical double-layer capacitor. 4,408,259., Cl. 361-434.000.

Murata, Kazuo: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,407,846., Cl. 427-35.000.

Murata, Kenji: *See*—
Enjouji, Katsuhisa; Ikeizumi, Hiroshi; Murata, Kenji; and Nishikawa, Syozaburo, 4,407,709., Cl. 204-192.0SP.

Murata, Shigeki; Kajino, Jirou; and Minabe, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recording and/or reproducing apparatus. 4,408,236., Cl. 360-85.000.

Murata, Yasunori, to Diamond Giken Co., Ltd. Cutting blade. 4,407,263., Cl. 125-15.000.

Murayama, Tetsuo; Otsuka, Shigenori; Tajima, Tsunemitsu; and Sato, Yukihiro, to Mitsubishi Chemical Industries Limited. Electrophotographic plate. 4,407,919., Cl. 430-58.000.

Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., to General Electric Company. Composite article. 4,407,885., Cl. 428-246.000.

Murray, Richard; and Irwin, Maurice J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Transport in Her Britannic Majesty's Government of the. Anchored earth structure. 4,407,611., Cl. 405-284.000.

Murray, Ronald E.: *See*—
Boocock, John R. B.; and Murray, Ronald E., 4,407,841., Cl. 426-656.000.

Musha, Toru, to Olympus Optical Company Limited. Objective lens driving device for tracking and focus corrections. 4,408,313., Cl. 369-45.000.

Mushroom Associates: *See*—
Ferguson, Andrew M.; and Malick, Howard M., 4,407,832., Cl. 426-281.000.

Mussi, Fiorenzo; and Pariani, Emilio, to Costruzioni Aeronautiche Giovanni Agusta S.p.A. Method of making helicopter blade spars. 4,407,688., Cl. 156-242.000.

Musy, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Thin wrist-watch. 4,407,586., Cl. 368-77.000.

Musyanovich, Vladimir M.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.

Mutsubishi Denki Kabushiki Kaisha: *See*—
Takatsuka, Keizo; Yamamoto, Hiroshi; and Baba, Toshihiro, 4,408,108., Cl. 200-148.00A.

Muzzell, Stephen E., to Gulf & Western Manufacturing Company. Integrated spring mat assembly for seating. 4,407,492., Cl. 267-103.000.

Myers, George D., deceased (by Myers, Virginia K., administrator); Hettinger, William P., Jr.; and Kovach, Stephen M., to Ashland Oil, Inc. Process for cracking high-boiling hydrocarbons using high pore volume, low density catalyst. 4,407,714., Cl. 208-120.000.

Myers, Robert E. Flush control mechanism for toilet tank. 4,407,026., Cl. 4-365.000.

Myers, Virginia K., administrator: *See*—
Myers, George D., deceased; Hettinger, William P., Jr.; and Kovach, Stephen M., 4,407,714., Cl. 208-120.000.

N. V. Bekaert S.A.: *See*—
Veys, Pierre, 4,408,156., Cl. 324-58.50R.

Naarmann, Herbert; Penzien, Klaus; and Schlag, Johannes, to BASF Aktiengesellschaft. Preparation of electrically conductive polymers. 4,407,739., Cl. 252-512.000.

Nabisco Brands, Inc.: *See*—
Bosco, Peter M.; and Danielson, Robert L., 4,407,836., Cl. 426-576.000.

Nagai, Kunihiko: *See*—
Komatsu, Shigeru; Nagai, Kunihiko; Koyama, Takuo; Tachiuchi, Tsuguji; and Hirahata, Shigeru, 4,408,197., Cl. 340-720.000.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Resistorless digital-to-analog converter using cascaded current mirror circuits. 4,408,190., Cl. 340-347.0DA.

Naganoma, Masanori: *See*—
Saito, Atsunori; Naganoma, Masanori; Iwata, Yasuhiro; and Usami, Kiyoshi, 4,408,278., Cl. 364-424.000.

Nagasaka, Hiroyasu: *See*—
Sawa, Shigeki; Nagasaka, Hiroyasu; Saito, Makoto; Mizuno, Masashi; and Kozima, Katuhiro, 4,407,682., Cl. 148-128.000.

Nagel, Rudolf: *See*—
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; and Rubrecht, Jens-Detlef, 4,408,289., Cl. 364-551.000.

Nahon, Richard; and Decuyper, Jean-Claude, to Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel. Method and apparatus for accentuating the features of a monochrome image reproduced by means of a digital transcription. 4,408,233., Cl. 358-284.000.

Naito, Yoshio, to Nippon Piston Ring Co., Ltd.,. Combined oil ring. 4,407,515., Cl. 277-139.000.

Naka, Michiro: *See*—
Shima, Mutsuo; Aoyama, Kensuke; and Naka, Michiro, 4,407,881., Cl. 428-156.000.

Nakada, Yoshinao: *See*—
Haas, Laird K. S.; Herring, Larry H.; and Nakada, Yoshinao, 4,407,849., Cl. 427-37.000.

Nakai, Kiyoshi: *See*—
Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, 4,408,086., Cl. 568-719.000.

Nakai, Yoshiharu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Nakai, Yoshiharu; Sakane, Kazuo; and Goto, Jiro, 4,407,798., Cl. 424-246.000.

Nakajima, Fumito: *See*—
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.

Nakajima, Koe: *See*—
Watanabe, Kazuo; Tokita, Hideki; and Nakajima, Koe, 4,407,056., Cl. 29-527.700.

Nakajima, Yasuyuki: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,407,813., Cl. 424-273.00P.

Nakamatsu, Yoshiro. Device for manufacturing a magnetic recording medium. 4,407,226., Cl. 118-623.000.

Nakamoto, Takashi: *See*—
Nakamura, Tstomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, 4,407,353., Cl. 165-39.000.

Nakamura, Akira: *See*—
Akino, Tadaharu; Nakamura, Akira; and Uemura, Hiroyuki, 4,408,171., Cl. 333-177.000.

Nakamura, Ikushi, to Minolta Camera Kabushiki Kaisha. Autoloading apparatus for photographic film. 4,407,577., Cl. 354-173.000.

Nakamura, Keijiroh: *See*—
Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, 4,407,959., Cl. 435-288.000.

Nakamura, Kengi, to Sanyo Electric Co., Ltd. Flyback transformer. 4,408,176., Cl. 336-107.000.

Nakamura, Osamu, to Tsukamoto Seiki Co., Ltd. Pressure compensator for rotary earth boring tool. 4,407,375., Cl. 175-228.000.

Nakamura, Shinichi; Kadowaki, Takashi; Okumura, Mitsuhiro; and Takada, Syun, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material. 4,407,940., Cl. 430-546.000.

Nakamura, Tomio; and Doi, Shunichi, to Nitto Chemical Industries, Ltd. Process for producing carboxylic acid esters from nitriles. 4,408,067., Cl. 560-215.000.

Nakamura, Toshiaki: *See*—
Takamura, Tsutomu; Sato, Yuichi; Nakamura, Toshiaki; and Suzuki, Nobukazu, 4,407,907., Cl. 429-42.000.

Nakamura, Toshihiro, to Toso Kabushiki Kaisha. Apparatus for stretching and linking a vertical blind slat-cloth. 4,407,350., Cl. 160-178.00R.

Nakamura, Tstomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, to Snow Brand Milk Products Co., Ltd.; and Suzuki Metal Industry Co., Ltd. Waste heat recovery device for preventing corrosion by sulfur oxides. 4,407,353., Cl. 165-39.000.

Nakanishi, Keiichi, to Nissan Motor Company, Ltd. Fuel-supply control system. 4,407,251., Cl. 123-472.000.

Nakao, Shinji: *See*—
Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, 4,408,086., Cl. 568-719.000.

Nakata, Shuji; Nishikawa, Masahiro; and Kawaguchi, Yoshio, to Nissan Motor Company, Limited, by said Yoshio Kawaguchi. Resistance welding with pressure control in response to deviation between welding voltage and time varying reference values therefor. 4,408,114., Cl. 219-110.000.

Nakatani, Hiroshi; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. Data print control in an electronic cash register. 4,408,292., Cl. 364-405.000.

Nakauchi, Jun; and Kawamura, Tomihiko, to Mitsubishi Rayon Co., Ltd. Sensitive resins comprising 2-alkylglycidyl methacrylate homopolymer or copolymer. 4,407,895., Cl. 428-463.000.

Nakayama, Naoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Document data filing/retrieval system. 4,408,181., Cl. 82-61.000.

Nakayama, Yasuharu; Iwai, Hiroshi; and Sukejima, Hajime, to Kansai Paint Co., Ltd. Oxidation-curable emulsion composition containing a cellulose derivative. 4,408,028., Cl. 526-200.000.

Nalco Chemical Company: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,408,043., Cl. 544-87.000.

Namekata, Yoriaki, to Arimitsu Industry Co., Ltd. Reciprocating pump having unique pressure control valve construction. 4,407,640., Cl. 417-296.000.

Nanda, Vinod K., to Vickers, Incorporated. Power transmission. 4,407,122., Cl. 60-452.000.

Naoe, Masahiko: *See*—
Kadokura, Sadao; Tomie, Takashi; and Naoe, Masahiko, 4,407,894., Cl. 428-457.000.

Naoi, Takashi; Kawasaki, Hiroshi; Yamaguchi, Jun; Tatsuta, Sumitaka; and Sera, Hidefumi, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material with subbing layers. 4,407,939., Cl. 430-536.000.

Nappholz, Tibor A.; and Swift, Stephen J., to Telectronics Pty. Ltd. Externally-reset tachycardia control pacer. 4,407,289., Cl. 128-419.0PG.

Narasaka, Shin: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,407,243., Cl. 123-179.00G.

Naruo, Kyoichi: *See*—
Okita, Tsutomu; Naruo, Kyoichi; and Akashi, Goro, 4,407,853., Cl. 427-44.000.

Nat, Gursharan P. S., to Eaton Corporation. Latch down device for push-button switches. 4,408,109., Cl. 200-153.00J.

National Distillers and Chemical Corporation: *See*—
Muller, Werner C.; and Miller, Franklyn D., 4,407,955., Cl. 435-161.000.

National Patent Development Corporation: *See*—
Haardt, Henry; Magdon, John; and Noble, Eric, 4,407,766., Cl. 264-2.200.

National Research Development Corporation: *See*—
Crabb, Trevor A.; Jackson, Graham C.; and Jupp, Philip A., 4,407,670., Cl. 71-67.000.
Culshaw, Brian; Ball, Peter R.; Kingsley, Stuart A.; and Davies, David E. N., 4,408,354., Cl. 455-610.000.

National Steel Corporation: *See*—
Manzonelli, Carmen C.; and Chatfield, David A., 4,407,679., Cl. 148-2.000.
Smith, John R.; Bingle, William D.; and Austin, Lowell W., 4,407,149., Cl. 72-47.000.

Nau, Walter: *See*—
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,407,449., Cl. 237-12.30R.

Navi, Menashe: *See*—
Matalia, Harshad D.; and Navi, Menashe, 4,407,196., Cl. 101-142.000.

NCR Corporation: *See*—
Grabowski, John S.; Shiau, Chin-Chih; and Latala, John R., 4,408,342., Cl. 382-9.000.

Neff, James A., to MAC Valves, Inc. Cartridge type pilot valve. 4,407,323., Cl. 137-454.200.

Nehrkorn, Rolf. Apparatus for delivering merchandise from a vending machine. 4,407,430., Cl. 221-122.000.

Neill, Jimmie; Webb, Nathaniel; and Hartig, Norman F., to Burroughs Corporation. Image enhancement for optical character readers. 4,408,343., Cl. 382-52.000.

Nelson, Frederick J., to Owens-Illinois, Inc. Waste heat recovery from regenerative furnaces. 4,407,669., Cl. 65-134.000.

Nelson, Marvin D.; and Pinckaers, B. Hubert, to Honeywell Inc. Self centering current responsive pickup means. 4,408,175., Cl. 336-92.000.

Neotechnic Engineering Limited: *See*—
Bolton, Philip; and Burdekin, Norman, 4,407,481., Cl. 251-353.000.

Neturen Company, Ltd.: *See*—
Hijikata, Toshio; and Kawasaki, Kazuhiro, 4,407,683., Cl. 148-144.000.

Neumann, Ernst D.: *See*—
Moser, Gottfried; Nau, Walter; and Neumann, Ernst D., 4,407,449., Cl. 237-12.30R.

Neumann, Peter: *See*—
Eilingsfeld, Heinz; Neumann, Peter; Seybold, Guenther; Lenke, Dieter; and Friedrich, Ludwig, 4,407,810., Cl. 424-270.000.

Neumeier, L. A.: *See*—
Holman, James L., Jr.; McIlwain, John F.; and Neumeier, L. A., 4,407,775., Cl. 419-36.000.

Nevens, Charles; and Williams, Ronald A., to Baxter Travenol Laboratories, Inc. Plasmapheresis assembly and associated fluid manifold. 4,407,660., Cl. 604-6.000.

New Zealand Wire Industries Limited: *See*—
Peel, Colin D., 4,407,221., Cl. 118-109.000.

Newby, John C. Solar powered liquid metering device. 4,407,637., Cl. 417-138.000.

Newton, Jimmy D., to Taylor, Thomas L. Bowling aid. 4,407,499., Cl. 273-54.00B.

Newton, Thomas D., to UOP Inc. Laminates for printed circuit boards. 4,407,883., Cl. 428-215.000.

Neyer, James U., to Synchro-Start Products, Inc. Protective boot for solenoid. 4,407,517., Cl. 277-212.0FB.

NGK Insulators, Ltd.: *See*—
Mase, Syunzo; and Soejima, Shigeo, 4,407,704., Cl. 204-1.00T.

Nice, Ralph A., to Atlantic Richfield Company. Process for coating a sterilizing filter material with silver and product formed thereby. 4,407,865., Cl. 427-217.000.

Nicolau, Gabriela; and Tonelli, Alfred P., to American Cyanamid Company. Inclusion compound of p-hexadecylamino benzoic acid in cyclodextrin and method of use. 4,407,795., Cl. 424-180.000.

Nicoli, David F.: *See*—
Elings, Virgil B.; and Nicoli, David F., 4,407,964., Cl. 436-518.000.

Nielsen, Anker J., Jr., to Omco, Inc. Gas meter lock assembly. 4,407,146., Cl. 70-232.000.

Nifco Inc.: *See*—
Kimura, Shigeru, 4,407,618., Cl. 411-40.000.

Niiler, Andrus: *See*—
Henshaw, William F.; White, John R.; and Niiler, Andrus, 4,407,712., Cl. 204-298.000.

Nikolov, Dobrin V.: *See*—
Sheludko, Alexey D.; Ivanov, Rumen V.; Nikolov, Dobrin V.; and Nishkov, Ivan M., 4,407,715., Cl. 209-164.000.

Nilsson, Lars-Erik; and Lofling, Tommy, to Aktiebolaget Samefa. Measuring apparatus for checking a spring strut appertaining to the front wheel suspension of a vehicle. 4,407,073., Cl. 33-203.180.

Nippon Electric Co., Ltd.: *See*—
Ishii, Daisuke, 4,408,099., Cl. 179-2.0EC.
Ohnuki, Katsutoshi; and Suzuki, Yasuo, 4,407,535., Cl. 292-27.000.
Oura, Toshio, 4,408,094., Cl. 381-120.000.
Yukawa, Tatsuo, 4,408,349., Cl. 455-182.000.

Nippon Kogaku K.K.: *See*—
Tomino, Naoki; and Tsukamoto, Masaaki, 4,407,574., Cl. 354-50.000.
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Ohtsubo, Yoshiaki; and Akasaka, Shigeo, 4,407,573., Cl. 354-33.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Hara, Tomihiro; Ogawa, Masahiro; Yamashita, Masaaki; and Tajiri, Yasuhisa, 4,407,899., Cl. 428-626.000.

Nippon Piston Ring Co., Ltd.,: *See*—
Naito, Yoshio, 4,407,515., Cl. 277-139.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Enjouji, Katsuhisa; Ikeizumi, Hiroshi; Murata, Kenji; and Nishikawa, Syozaburo, 4,407,709., Cl. 204-192.0SP.

Nippon Steel Corporation: *See*—
Ina, Katutoshi; Yamamoto, Kazuo; Higashiyama, Hirokichi; Ishikawa, Norio; and Miyoshi, Hiroshi, 4,407,681., Cl. 148-12.00F.
Watanabe, Kazuo; Tokita, Hideki; and Nakajima, Koe, 4,407,056., Cl. 29-527.700.

Nippondenso Co., Ltd.: *See*—
Hara, Masahiro; Sakai, Toshiyasu; and Okamoto, Atsutoshi, 4,408,120., Cl. 235-462.000.
Saito, Atsunori; Naganoma, Masanori; Iwata, Yasuhiro; and Usami, Kiyoshi, 4,408,278., Cl. 364-424.000.

Nishibe, Shinji, to Tokyo Shibaura Denki Kabushiki Kaisha. Read-out control system for a control storage device. 4,408,276., Cl. 364-200.000.

Nishida, Koji; and Kawai, Taneichi, to Aisin Seiki Kabushiki Kaisha. Magnetic recording member for automatic embroidering machine. 4,408,242., Cl. 360-131.000.

Nishikawa, Masahiro: *See*—
Nakata, Shuji; Nishikawa, Masahiro; and Kawaguchi, Yoshio, 4,408,114., Cl. 219-110.000.

Nishikawa, Syozaburo: *See*—
Enjouji, Katsuhisa; Ikeizumi, Hiroshi; Murata, Kenji; and Nishikawa, Syozaburo, 4,407,709., Cl. 204-192.0SP.

Nishimura, Katsuo: *See*—
Ohno, Hideshi; Kume, Kazunari; Osaka, Takatoshi; Nishimura, Katsuo; Tamaru, Munetaka; and Ode, Sadao, 4,407,590., Cl. 368-204.000.

Nishimura, Masaru; Shikata, Osamu; and Ohtsuka, Yoshikuni, to Nitto Seiko Co., Ltd. Fastener feeding apparatus. 4,407,402., Cl. 198-389.000.

Nishino, Atsushi; Suzuki, Tadashi; Ikeda, Masaki; and Ohtani, Tadashi, to Matsushita Electric Industrial Co., Ltd. Variable capacitor. 4,408,253., Cl. 361-293.000.

Nishio, Takashi: *See*—
Tsunoda, Taiji; Nishio, Takashi; and Tanikawa, Eiki, 4,408,319., Cl. 369-275.000.

Nishizawa, Hideyuki. Golf practice device. 4,407,503., Cl. 273-197.00R.

Nishizawa, Jun-ichi; Tadahiro, Ohmi; and Tamamushi, Takashige, to Semiconductor Research Foundation. Semiconductor memory. 4,408,304., Cl. 365-174.000.

Nishkov, Ivan M.: *See*—
Sheludko, Alexey D.; Ivanov, Rumen V.; Nikolov, Dobrin V.; and Nishkov, Ivan M., 4,407,715., Cl. 209-164.000.

Nissan Chemical Industries Ltd.: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,407,813., Cl. 424-273.00P.

Nissan Motor Company, Limited: *See*—
Abo, Toshimi, 4,407,259., Cl. 123-620.000.
Fukushima, Naoto; Hidaka, Kunihiko; and Iwata, Kazuroh, 4,407,397., Cl. 188-282.000.
Iijima, Tetsuya; and Takahashi, Seiichi, 4,407,446., Cl. 236-49.000.
Izumi, Masao; Maruyama, Hideki; and Yoshida, Hiroshi, 4,407,186., Cl. 98-2.000.
Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,407,057., Cl. 29-570.000.
Kubo, Jun; and Honda, Minoru, 4,408,290., Cl. 364-566.000.
Masaki, Kenji, 4,407,247., Cl. 123-438.000.
Matsumura, Akira, 4,408,179., Cl. 340-32.000.
Nakanishi, Keiichi, 4,407,251., Cl. 123-472.000.
Nakata, Shuji; Nishikawa, Masahiro; and Kawaguchi, Yoshio (said Yoshio Kawaguchi assors. to), 4,408,114., Cl. 219-110.000.
Sawamura, Keiichi, 4,407,735., Cl. 502-10.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Tanaka, Kenji; and Endo, Shigeru, 4,407,827., Cl. 426-19.000.

Nitto Boseki Co., Ltd.: *See*—
Kitamura, Tadanori; and Takao, Nobuyuki, 4,407,866., Cl. 427-221.000.

Nitto Chemical Industries, Ltd.: *See*—
Nakamura, Tomio; and Doi, Shunichi, 4,408,067., Cl. 560-215.000.

Nitto Seiko Co., Ltd.: *See*—
Nishimura, Masaru; Shikata, Osamu; and Ohtsuka, Yoshikuni, 4,407,402., Cl. 198-389.000.

Nixdorf Computer AG: *See*—
Haftmann, Johannes, 4,407,593., Cl. 400-208.000.

Nixon, Charles E. Extremely low-attenuation, extremely low radiation loss flexible coaxial cable for microwave energy in the gigaHertz frequency range. 4,408,089., Cl. 174-34.000.

Noble, Bruce P.: *See*—
Le, Tri C.; and Noble, Bruce P., 4,407,516., Cl. 277-206.00R.

Noble, Eric: *See*—
Haardt, Henry; Magdon, John; and Noble, Eric, 4,407,766., Cl. 264-2.200.

Noda, Fumio; Hayashi, Kazuya; Mogi, Keitaro; Iwaasa, Takashi; Sakasai, Toshio; and Iguchi, Nobuyoshi, to Kikkoman Shoyu Co. Ltd. Method of producing Koji products. 4,407,826., Cl. 426-7.000.

Noda, Touru: *See*—
Kubbota, Masashi; and Noda, Touru, 4,407,896., Cl. 428-513.000.

Noiles, Douglas G.; and Crawford, John O., to United States Surgical Corporation. Surgical staples. 4,407,286., Cl. 128-334.00R.

Nolan, William D. Energy water-saver home shampooer. 4,407,028., Cl. 4-516.000.

Nomura, Hiroaki: *See*—
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, 4,408,052., Cl. 546-22.000.

Nomura, Kikuo: *See*—
Hagihara, Bunji; Fukai, Tamotsu; Nomura, Kikuo; Yoshida, Kenichi; and Isshiki, Isao, 4,407,291., Cl. 128-635.000.

Nomura, Manabu; Sugi, Norio; Tanaka, Takayoshi; and Hara, Koichi, to Idemitsu Petrochemical Co., Ltd. Polypropylene composition. 4,407,986., Cl. 523-200.000.

Nonogaki, Saburo: *See*—
Akagi, Motoo; Uchino, Shoichi; and Nonogaki, Saburo, 4,407,916., Cl. 430-23.000.

Normalair-Garrett (Holdings) Limited: *See*—
Furlong, Owen D.; and Moore, Leonard, 4,407,153., Cl. 73-23.000.

Norris, Dallas G., to Western Electric Company, Incorporated. Walking beam mechanism. 4,407,406., Cl. 198-774.000.

North American Philips Corporation: *See*—
Dapo, Roland F., 4,408,258., Cl. 361-433.000.

Northern Engineering Industries plc: *See*—
Tones, John, 4,407,634., Cl. 416-196.00R.

Northern Petrochemical Company: *See*—
Smart, John A., 4,407,879., Cl. 428-141.000.

Northern Telecom Limited: *See*—
Betts, Malcolm C.; Graves, Alan F.; Pascoe, Frederick M.; and Dilley, James E., 4,408,189., Cl. 340-347.0DD.
Grover, Wayne D., 4,408,325., Cl. 370-119.000.
Pan, Ali, 4,407,854., Cl. 427-49.000.

Norton, C. W. Two-piece snap-together floor and ceiling plate. 4,407,023., Cl. 4-191.000.

Norton, Charles T.: *See*—
Clore, Wayne G.; Norton, Charles T.; and Thompson, William P., 4,407,498., Cl. 273-1.50R.

Novakowski, Robert: *See*—
Pritz, George E.; and Novakowski, Robert, 4,408,100., Cl. 179-27.00D.

Nowaczyk, Philip J., to Zenith Radio Corporation. Balanced power supply with polarized capacitors. 4,408,269., Cl. 363-126.000.

Nowotny, Theodor: *See*—
Schlegel, Hans; Nowotny, Theodor; and Mayer, Rolf, 4,407,875., Cl. 428-43.000.

Nukem GmbH: *See*—
Hrovat, Milan; Huschka, Hans; and Rachor, Lothar, 4,407,742., Cl. 252-628.000.

Nukushina, Harunobu: *See*—
Ide, Yuuichi; and Nukushina, Harunobu, 4,407,139., Cl. 62-215.000.

Numaga, Hirooki: *See*—
Tojo, Toru; Sugihara, Kazuyoshi; Hata, Shuntaro; Numaga, Hirooki; Mukooyama, Haruhisa; and Suzuki, Yoshio, 4,408,126., Cl. 250-442.100.

Nutrisearch Company: *See*—
Swartz, William E., 4,407,831., Cl. 426-281.000.
Swartz, William E., 4,407,833., Cl. 426-281.000.

Nutter, John F., to Tosco Corporation. Apparatus for heating solid heat-carrying bodies. 4,407,653., Cl. 432-215.000.

O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Wolff, Friedrich, 4,407,399., Cl. 192-4.00A.

O. Mustad & Son A/S: *See*—
Huse, Per, 4,407,087., Cl. 43-4.000.

Oakes, Thomas R.; and Sadler, James L., to Economics Laboratory, Inc. Method of controlling bloat using nonionic surfactants. 4,407,790., Cl. 424-78.000.

Oberndorfer, Ernst, to Voest Alpine Aktiengesellschaft. Apparatus for discharging hot flowable solids from an upright container, particularly for discharging sponge iron from a shaft furnace. 4,407,489., Cl. 266-191.000.

O'Brien, John P. Golf training device. 4,407,506., Cl. 273-187.00B.

Ode, Sadao: *See*—
Ohno, Hideshi; Kume, Kazunari; Osaka, Takatoshi; Nishimura, Katsuo; Tamaru, Munetaka; and Ode, Sadao, 4,407,590., Cl. 368-204.000.

Odessky Politekhnichesky Institut: *See*—
Artemenko, Vladimir I.; Belikov, Viktor T.; Ivlev, Anatoly D.; and Mamzelev, Viktor A., 4,408,145., Cl. 318-135.000.

Oei, Djong-Gie: *See*—
Kummer, Joseph T.; and Oei, Djong-Gie, 4,407,902., Cl. 429-15.000.

Offterdinger, Hermann F. Clamps. 4,407,050., Cl. 24-277.000.

Ogawa, Keisuke: *See*—
Ichiyanagi, Toshikazu; Sudoh, Kanzaburo; Ogawa, Keisuke; and Yamazaki, Nobuhiro, 4,407,652., Cl. 432-58.000.
Ogawa, Kenji, to Maier, Bruce R. Cleaning device. 4,408,241., Cl. 360-128.000.
Ogawa, Masahiro: *See*—
Hara, Tomihiro; Ogawa, Masahiro; Yamashita, Masaaki; and Tajiri, Yasuhisa, 4,407,899., Cl. 428-626.000.
Ogden Electronics, Ltd.: *See*—
Steel, James, 4,407,388., Cl. 180-271.000.
Ogle, James A.: *See*—
Kuchinsky, Saul; Bellman, Robert H.; and Ogle, James A., 4,407,934., Cl. 430-314.000.
Ohki, Yoshimasa: *See*—
Kobayashi, Hiroyuki; Ohki, Yoshimasa; Toyoda, Yukio; and Akasaki, Isamu, 4,408,217., Cl. 357-17.000.
Ohnishi, Shunji: *See*—
Furuya, Setsuko; Ohnishi, Shunji; and Kato, Masao, 4,408,012., Cl. 525-161.000.
Ohno, Hideshi; Kume, Kazunari; Osaka, Takatoshi; Nishimura, Katsuo; Tamaru, Munetaka; and Ode, Sadao, to Citizen Watch Co., Ltd. Battery for an electric timepiece. 4,407,590., Cl. 368-204.000.
Ohnuki, Katsutoshi; and Suzuki, Yasuo, to Nippon Electric Co., Ltd. Container-locking mechanism. 4,407,535., Cl. 292-27.000.
Ohta Company Limited: *See*—
Iseki, Kazuo, 4,407,044., Cl. 16-237.000.
Ohta, Hiroyasu: *See*—
Komatsu, Michiyasu; Tsuge, Akihiko; and Ohta, Hiroyasu, 4,407,971., Cl. 501-97.000.
Ohtani, Tadashi: *See*—
Nishino, Atsushi; Suzuki, Tadashi; Ikeda, Masaki; and Ohtani, Tadashi, 4,408,253., Cl. 361-293.000.
Ohtsubo, Yoshiaki: *See*—
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Ohtsubo, Yoshiaki; and Akasaka, Shigeo, 4,407,573., Cl. 354-33.000.
Ohtsuka, Yoshikuni: *See*—
Nishimura, Masaru; Shikata, Osamu; and Ohtsuka, Yoshikuni, 4,407,402., Cl. 198-389.000.
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Tsuchiko, Susumu; Tawara, Kazuo; and Yamasoba, Takahiko, to Toyo Ink Manufacturing Co., Ltd. Process for production of laminated member. 4,407,689., Cl. 156-243.000.
Ohtsuki, Masataka: *See*—
Yamanaka, Minoru; Suzuki, Mitsuyuki; Haneda, Hideo; Kato, Masatoshi; and Ohtsuki, Masataka, 4,407,448., Cl. 236-88.000.
Okabe, Sigeru: *See*—
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.
Okada, Hideo: *See*—
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.
Okamoto, Atsutoshi: *See*—
Hara, Masahiro; Sakai, Toshiyasu; and Okamoto, Atsutoshi, 4,408,120., Cl. 235-462.000.
Okamoto, Takachiyo, to Brother Kogyo Kabushiki Kaisha. Linear stepper motor. 4,408,138., Cl. 310-12.000.
Okawa, Takashi: *See*—
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,408,080., Cl. 568-484.000.
Okita, Tsutomu; Naruo, Kyoichi; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Process for producing a magnetic recording medium. 4,407,853., Cl. 427-44.000.
Okolischan, Raymond A., to Carr Lane Mfg. Co. Self-adjusting toggle clamps for factory fixtures and the like. 4,407,493., Cl. 269-93.000.
Okumura Corporation: *See*—
Ito, Toshihiko, 4,407,622., Cl. 414-468.000.
Okumura, Mitsuhiro: *See*—
Nakamura, Shinichi; Kadowaki, Takashi; Okumura, Mitsuhiro; and Takada, Syun, 4,407,940., Cl. 430-546.000.
Olivetti Controllo Numerico S.p.A.: *See*—
Bedini, Raffaele; Lauro, Luciano; and Pinotti, Pier C., 4,408,280., Cl. 364-474.000.
Olson, David A. Feed conveyor. 4,407,408., Cl. 198-621.000.
Olson, George P.: *See*—
Hall, David A.; and Olson, George P., 4,407,193., Cl. 101-93.010.
Olympia Werke AG: *See*—
Fessel, Rudolf; von Knorre, Karl-Friedrich; Tillich, Peter; and Herbermann, Gottfried, 4,408,302., Cl. 364-900.000.
Olympic Fastening Systems: *See*—
Siebol, George, 4,407,619., Cl. 411-43.000.
Olympus Optical Co., Ltd.: *See*—
Furuta, Kenji, 4,408,234., Cl. 360-69.000.
Hayasaka, Toshimi, 4,407,570., Cl. 350-529.000.
Musha, Toru, 4,408,313., Cl. 369-45.000.
Sato, Eiichi, 4,407,918., Cl. 430-54.000.
Watanabe, Seizo, 4,407,861., Cl. 427-130.000.
Yamaguchi, Tatuya, 4,407,272., Cl. 128-6.000.
Omco, Inc.: *See*—
Nielsen, Anker J., Jr., 4,407,146., Cl. 70-232.000.
Omron Tateisi Electronics Co.: *See*—
Arichi, Isao; Waniisi, Tetuya; and Koh, Takuji, 4,407,588., Cl. 368-118.000.
Ong, Helen H.; and Profitt, James A., to American Hoechst Corporation. Spiro(indoline-3,4'-piperidine) and related compounds. 4,408,050., Cl. 546-17.000.
Ono, Saichi: *See*—
Kawasaki, Takao; Immaru, Daisaku; Osaka, Yoshiaki; Tsuchiya, Tadashi; and Ono, Saichi, 4,407,799., Cl. 424-246.000.
Ono, Seiichiro: *See*—
Uozumi, Norihira; Yamagata, Takeo; Yasukawa, Saburo; Tsutsumi, Yasuyuki; and Ono, Seiichiro, 4,407,904., Cl. 429-26.000.
Onoda, Hiroshi: *See*—
Kurachi, Hisao; Ito, Takeo; and Onoda, Hiroshi, 4,407,592., Cl. 400-54.000.
Optek, Inc.: *See*—
Kavage, William T.; and Monroe, Marvin E., 4,408,295., Cl. 364-552.000.
Optimizer Control Corporation: *See*—
Collins, Thomas W.; and Croskey, Charles L., 4,408,149., Cl. 318-729.000.
Ordas, Dale. Apparatus and method for applying hot wax to skis. 4,407,218., Cl. 118-59.000.
O'Reilly, Kevin G., to Hall & Kay Engineering Limited. Heat recovery. 4,407,142., Cl. 62-238.600.
Orient Chemical Industries, Ltd.: *See*—
Senshu, Hisashi; Ishikawa, Kazuhiro; Ishida, Yukihiko; and Kawagishi, Yoji, 4,407,924., Cl. 430-109.000.
Ortho Pharmaceutical Corporation: *See*—
Kanojia, Ramesh M.; Wachter, Michael P.; and Chen, Robert H. K., 4,408,060., Cl. 549-332.000.
Osaka, Takatoshi: *See*—
Ohno, Hideshi; Kume, Kazunari; Osaka, Takatoshi; Nishimura, Katsuo; Tamaru, Munetaka; and Ode, Sadao, 4,407,590., Cl. 368-204.000.
Osaka, Yoshiaki: *See*—
Kawasaki, Takao; Immaru, Daisaku; Osaka, Yoshiaki; Tsuchiya, Tadashi; and Ono, Saichi, 4,407,799., Cl. 424-246.000.
Oshiro, Mitsuo: *See*—
Nakamura, Tatomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, 4,407,353., Cl. 165-39.000.
Ossian, William F.: *See*—
Christensen, Ronald C.; Genske, Roger P.; Kester, Dennis E.; and Ossian, William F., 4,407,873., Cl. 428-35.000.
Oswald, Norman D.; and Mankey, Harry S., to Standard Manufacturing Company, Inc. Undercarriage for adverse terrain vehicles. 4,407,381., Cl. 180-6.480.
Ota, Hiroyasu: *See*—
Komatsu, Michiyasu; Tsuge, Akihiko; and Ota, Hiroyasu, 4,407,970., Cl. 501-97.000.
Otis Engineering Corporation: *See*—
Bechthold, Howard D., 4,407,362., Cl. 166-117.500.
Johnston, Russell A., 4,407,364., Cl. 166-217.000.
Johnston, Russell A., 4,407,364., Cl. 166-217.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Motor Co., Ltd. Air/fuel ratio control system having function of controlling supply of secondary air into intake pipe of internal combustion engine. 4,407,243., Cl. 123-179.00G.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Yanaihara, Noboru, 4,407,965., Cl. 436-547.000.
Otsuka, Shigenori: *See*—
Murayama, Tetsuo; Otsuka, Shigenori; Tajima, Tsunemitsu; and Sato, Yukihiro, 4,407,919., Cl. 430-58.000.
Ottenhof, Henricus A. W. E. M.: *See*—
Lippe, Frank; Ottenhof, Henricus A. W. E. M.; and De Boer, Rudolf, 4,407,747., Cl. 260-120.000.
Otty, Malcolm. Electrical insulating stitch bonded material. 4,407,876., Cl. 428-102.000.
Ouchi, Teruo, to Kabushiki Kaisha Medos Kenkyusho. Raising means for guiding an implement of an endoscope. 4,407,273., Cl. 128-6.000.
Oura, Toshio, to Nippon Electric Co., Ltd. Output circuit. 4,408,094., Cl. 381-120.000.
Overseas International Distributors Company B.V.: *See*—
Thompson, Darrow; and Thompson, Daniel L., 4,407,466., Cl. 244-17.110.
Owens-Illinois, Inc.: *See*—
Nelson, Frederick J., 4,407,669., Cl. 65-134.000.
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, to Nissan Chemical Industries Ltd. Insecticidal pyrazoline derivatives and composition. 4,407,813., Cl. 424-273.00P.
Ozen Corporation: *See*—
Watanabe, Katsumi, 4,408,310., Cl. 369-41.000.
Paddock, Stephen W., to Whirlpool Corporation. Temperature sensing means for refrigerator. 4,407,141., Cl. 62-130.000.
Pahade, Ravindra F., to Union Carbide Corporation. Air separation process with turbine exhaust desuperheat. 4,407,135., Cl. 62-13.000.
Palmer, Keith W.: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,407,728., Cl. 502-60.000.
Pan, Ali, to Northern Telecom Limited. Manufacture of cable cores. 4,407,854., Cl. 427-49.000.
Panelographic Corporation: *See*—
Russell, Raymond J., 4,407,855., Cl. 427-54.100.
Paparizos, Christos: *See*—
Dolhyj, Serge R.; and Paparizos, Christos, 4,407,661., Cl. 44-78.000.
Paquin, Patrick J., to Allied Corporation. Apparatus for making low crosstalk ribbon cable. 4,407,693., Cl. 156-436.000.

Paras, Peter, to United States of America, Health and Human Services. BRH Test pattern for gamma camera performance (an evaluator). 4,408,124., Cl. 250-252.100.

Pariani, Emilio: *See*—
Mussi, Fiorenzo; and Pariani, Emilio, 4,407,688., Cl. 156-242.000.

Parisot, Daniel; and Mariaulle, Dominique. Automatic-search microfiche reader involving the use of a microcomputer. 4,408,287., Cl. 364-518.000.

Park, Moon-sung: *See*—
Pyo, Kwan-sung; and Park, Moon-sung, 4,407,090., Cl. 46-118.000.

Parks, William W., to Vapor Corporation. Lift assembly including a reaction switch. 4,407,623., Cl. 414-540.000.

Parmenon, Daniel: *See*—
Boudin, Daniel; Brachet, Claude; Desmier, Pierre; Foltier, Pierre; Godat, Jean; Krzywdziak, Alain; and Parmenon, Daniel, 4,407,584., Cl. 366-279.000.

Parsons, David, to Automotive Products Limited. Liquid pressure apparatus. 4,407,125., Cl. 60-584.000.

Pascoe, Frederick M.: *See*—
Betts, Malcolm C.; Graves, Alan F.; Pascoe, Frederick M.; and Dilley, James E., 4,408,189., Cl. 340-347.0DD.

Passariello, Attilio, to Ammonia Casale S.A. Catalysts for heterogeneous synthesis. 4,407,737., Cl. 502-243.000.

Pastore, David C., to RCA Corporation. Multichannel magnetic head for a recorder-reproducer system. 4,408,240., Cl. 360-121.000.

Patel, Hiralal V.; and Rudolph, Samuel A., to Dana Corporation. Hose end fitting. 4,407,532., Cl. 285-256.000.

Paton, Andrew: *See*—
Burr, Peter; Chase, Brian D.; Paton, Andrew; and Sowter, Brian R., 4,408,163., Cl. 324-404.000.

Patrie, Jos: *See*—
Ladet, Michel; Lefebvre, Jacques; and Patrie, Jos, 4,408,110., Cl. 200-263.000.

Patterson, Calvin D. Tobacco leaf-stripping machine. 4,407,305., Cl. 130-31.00R.

Paulos, John A. Matrix puzzle game. 4,407,502., Cl. 273-153.00S.

Paulos, Louis B.: *See*—
Huebsch, Donald L.; and Paulos, Louis B., 4,407,329., Cl. 137-629.000.

Pax Electro Products AB: *See*—
Thorn, Olov, 4,407,188., Cl. 98-116.000.

PCR Incorporated: *See*—
DePasquale, Ralph J.; and Schuman, Paul D., 4,408,048., Cl. 544-313.000.

Pearson, Eugene W.; and Short, Wilbur G., to Canron Corporation. Apparatus for handling cuttings from a shear. 4,407,628., Cl. 414-35.000.

Pearson, Ian G.: *See*—
Shepherd, Ian C.; Pearson, Ian G.; and Gibson, Donald C., 4,407,112., Cl. 56-13.400.

Pearson, Michael J.; and Branch, Clive L., to Beecham Group Limited. β-Lactam antibacterial compounds, their preparation and pharmaceutical compositions containing them. 4,407,815., Cl. 424-274.000.

Pearson, Richard D.; and Hewlett, Erik L., to University of Virginia Alumni Patents Foundation. Protozoacidal activity of phenothiazines. 4,407,800., Cl. 424-247.000.

Pedersen, S. Erik; Hardman, Harley F.; and Wagner, Louis F., to Standard Oil Company. Process for the production of carboxylic acids. 4,408,071., Cl. 562-536.000.

Peel, Colin D., to New Zealand Wire Industries Limited. Coating of wire. 4,407,221., Cl. 118-109.000.

Peerless Manufacturing Company: *See*—
Sillers, Donald A., Jr., 4,407,664., Cl. 55-357.000.

Pellet, Regis J.; Gradassi, Michael J.; and Bertolacini, Ralph J., to Standard Oil Company, (Indiana). Catalyst and process of preparing. 4,407,736., Cl. 502-230.000.

Pelletier, Georges H.: *See*—
Black, David H. A.; and Pelletier, Georges H., 4,408,324., Cl. 370-81.000.

Pelley, Ronald L. Memory power engine. 4,407,124., Cl. 60-527.000.

Pengilly, Brian W., to Goodyear Tire & Rubber Company, The. High clarity, low haze polyesters having reduced infrared heat-up times. 4,408,004., Cl. 524-398.000.

Penkert, Rosemarie: *See*—
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; Bischoff, Ludwig; Penkert, Rosemarie; and Siefert, Eicke, 4,407,947., Cl. 435-85.000.

Penn, Howard I., to Morton Thiokol, Inc. Adhesive comprising reaction product of gamma-isocyanatopropyltriethoxy silane and a thermoplastic polyester. 4,408,021., Cl. 525-440.000.

Penny, Glenn S.: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,408,043., Cl. 544-87.000.

Penzien, Klaus: *See*—
Naarmann, Herbert; Penzien, Klaus; and Schlag, Johannes, 4,407,739., Cl. 252-512.000.

Perdue, Terry A., to Heath Company. Variable speed tuning selector. 4,408,172., Cl. 334-11.000.

Perfection Corporation: *See*—
Cicenas, Christopher W., 4,407,526., Cl. 285-27.000.

Perkin-Elmer Corporation, The: *See*—
Bruce, Richard H.; and Reinberg, Alan R., 4,407,850., Cl. 427-38.000.

Perlin, Afred R., to Metatech Corporation. Microsurgical clip for brain surgery or the like. 4,407,285., Cl. 128-325.000.

PermaGrain Products, Inc.: *See*—
Witt, Alvin E., 4,407,884., Cl. 428-220.000.

Perrey, Hermann; Matner, Martin; Schwinum, Ernst; and Rudolph, Hans, to Bayer Aktiengesellschaft. Process for producing emulsion. 4,407,724., Cl. 252-312.000.

Peruzzi, Federigo: *See*—
Andrione, Norbert; and Peruzzi, Federigo, 4,407,168., Cl. 74-579.00E.

Peters, Josef: *See*—
Schneider, Wolfangang; Peters, Josef; and Gaffal, Karl, 4,407,631., Cl. 415-122.00R.

Peters, Philip H.; and Itani, Abdallah M., to General Electric Company. Pulse modulated electronic voltage controller with smooth voltage output. 4,408,268., Cl. 363-62.000.

Petersen, Christian C., to Polaroid Corporation. Efficient electromagnetic actuator usable as photographic shutter. 4,407,578., Cl. 354-235.000.

Petroff, Peter D. Flow analyzer. 4,407,158., Cl. 73-196.000.

Pettorino, Arthur J. Adjustable fresh air damper for combustion. 4,407,264., Cl. 126-120.000.

Petz, Gunter. Arrangement for connecting edge areas of thin-walled bodies. 4,407,534., Cl. 285-305.000.

Pfefferle, William C., to Engelhard Corporation. Method of conducting catalytically promoted gas-phase reactions. 4,407,785., Cl. 423-659.000.

Pfeil, Janice L.: *See*—
Kukolja, Stjepan; and Pfeil, Janice L., 4,407,750., Cl. 260-239.00A.

Pfizer Inc.: *See*—
DeZeeuw, John R.; and Stasko, Irene, 4,407,953., Cl. 435-145.000.
Schnur, Rodney C., 4,407,811., Cl. 424-272.000.

Pham Van Cang, Luc, to Thomson-CSF. Television base signal and test signal generator. 4,408,337., Cl. 377-44.000.

Phelps Dodge Industries, Inc.: *See*—
Sollner, George H.; Disque, Donny R.; and Knerr, Allan R., 4,408,032., Cl. 528-48.000.

Philipp Holzman AG: *See*—
Krabbe, Wilfried, 4,407,098., Cl. 52-167.000.

Phillips Petroleum Company: *See*—
Drake, Charles A.; and Turk, Stanley D., 4,408,037., Cl. 528-346.000.
Garcia, Rodrigo A.; Moreno, Roel; and Martinovich, Robert J., 4,407,768., Cl. 264-54.000.
Irvin, Howard B., 4,408,039., Cl. 528-500.000.

Pickens, Donald: *See*—
Ulmer, Harry E.; Pickens, Donald; Rahl, Forrest J.; and Lefrancois, Philip A., 4,407,783., Cl. 423-347.000.

Piduch, Hans-Gunter: *See*—
Kwasnik, Hans-Jurgen; and Piduch, Hans-Gunter, 4,407,702., Cl. 202-263.000.

Pieniak, Heinz A., to Johnson & Johnson Baby Products Company. Laminated structures having gathered and ungathered marginal portions and method of manufacturing the same. 4,407,284., Cl. 604-385.000.

Piller, Horst; and Weber, Klaus, to Zeiss-Stiftung, Carl. Device for selectively available phase-contrast and relief observation in microscopes. 4,407,569., Cl. 350-509.000.

Pinckaers, B. Hubert: *See*—
Nelson, Marvin D.; and Pinckaers, B. Hubert, 4,408,175., Cl. 336-92.000.

Pinotti, Pier C.: *See*—
Bedini, Raffaele; Lauro, Luciano; and Pinotti, Pier C., 4,408,280., Cl. 364-474.000.

Pioneer Electronic Corporation: *See*—
Tsunoda, Taiji; Nishio, Takashi; and Tanikawa, Eiki, 4,408,319., Cl. 369-275.000.
Yashiro, Kenji; and Tabata, Toshio, 4,408,345., Cl. 455-3.000.

Pirog, Nikolai I.: *See*—
Chegolya, Alexandr S.; Malykh, Vladimir A.; Chizhov, Vladimir V.; Yankov, Viktor I.; and Pirog, Nikolai I., 4,407,450., Cl. 239-8.000.

Pitts, Warren R., to Dennison Manufacturing Company. Anaerobic process for curing radiation curable compositions. 4,407,856., Cl. 427-54.100.

Pizzagalli, Franco: *See*—
Wirz, Gustav; and Pizzagalli, Franco, 4,407,262., Cl. 125-13.00R.

Place, Harry, to ITT Industries, Inc. Cryptographic encoder-decoder. 4,408,093., Cl. 178-22.190.

Platonova, Evdokia V.: *See*—
Gorbacheva, Irina N.; Kozinda, Zinaida J.; Suvorova, Elena G.; Chertov, Viktor A.; Dvoskin, Semen I.; Platonova, Evdokia V.; Podgaevskaya, Tatyana A.; and Skvirenko, Andrei B., 4,407,748., Cl. 260-153.000.

Plessey Overseas Limited: *See*—
Wheatley, Nigel J.; and Andrews, Martyn P., 4,408,274., Cl. 364-200.000.

Plow, Gregory M., to International Business Machines Corporation. Method and means for cataloging data sets using dual keyed data sets and direct pointers. 4,408,273., Cl. 364-200.000.

Pneu Uniroyal Englebert: *See*—
Mirtain, Henri J., 4,407,347., Cl. 152-361.0FP.

Podgaevskaya, Tatyana A.: *See*—
Gorbacheva, Irina N.; Kozinda, Zinaida J.; Suvorova, Elena G.; Chertov, Viktor A.; Dvoskin, Semen I.; Platonova, Evdokia V.; Podgaevskaya, Tatyana A.; and Skvirenko, Andrei B., 4,407,748., Cl. 260-153.000.

Pokar, Hellmut: *See—*
Brandt, Ludwig; and Pokar, Hellmut, 4,407,281., Cl. 128-207.150.

Polakoff, Frank. Battery operated charm light. 4,408,261., Cl. 362-104.000.

Polaroid Corporation: *See—*
Huff, Joseph F., 4,407,579., Cl. 354-275.000.
Petersen, Christian C., 4,407,578., Cl. 354-235.000.

Pollock, David C. I., to C-I-L Inc. Long vertical shaft bioreactor with pressurized head tanks. 4,407,718., Cl. 210-626.000.

Popov, Richard. Amusement device. 4,407,504., Cl. 273-153.00R.

Posch, Rainer: *See—*
Thiele, Hartmut; Schmelter, Dieter; and Posch, Rainer, 4,407,412., Cl. 206-404.000.

Post Office: *See—*
Hines, Howard E.; Hardy, Rex F. G.; and Butler, David S., 4,407,337., Cl. 140-124.000.

Potters Supply Company, The: *See—*
Irwin, David M., 4,407,654., Cl. 432-258.000.

PPG Industries, Inc.: *See—*
Eads, Carl W.; and Haynes, Ronald L., 4,408,016., Cl. 525-277.000.
Ernsberger, Fred M., 4,407,891., Cl. 428-410.000.

Prasad, Chandrika: *See—*
Fleming, Rebecca P.; Lawhorne, Samuel, Jr.; Mele, John J.; and Prasad, Chandrika, 4,407,860., Cl. 427-98.000.

Precise Forms, Inc.: *See—*
Trimmer, James E.; and Worley, Ross W., 4,407,480., Cl. 249-189.000.

Precision Automation Co., Inc.: *See—*
Wright, Stanley, 4,407,046., Cl. 17-11.000.

Precision Screen Machines, Inc.: *See—*
Jaffa, David, 4,407,195., Cl. 101-123.000.

Preh Elektrofeinmechanische Werke Jakob Preh: *See—*
Bauer, Karl-Heinz, 4,408,346., Cl. 455-175.000.

Price, Frank C.: *See—*
Garner, Derek H.; Price, Frank C.; Reader, Philip; Whittingham, David W.; White, Anthony M.; Shutt, Joseph A.; and Campling, Nicholas J., 4,407,033., Cl. 12-10.100.

Priegnitz, James W.: *See—*
deRosset, Armand J.; Priegnitz, James W.; and Landis, Arthur M., 4,408,065., Cl. 560-67.000.

Priesch, Manfred: *See—*
Holtschmidt, Ulrich; Koerner, Gotz; Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,408,031., Cl. 528-26.000.

Pritz, George E.; and Novakowski, Robert, to Data Plus, Inc. Position load distribution and management system for key telephone systems. 4,408,100., Cl. 179-27.00D.

Privates Institut fur Physikalisch Technische Auftragsforschung GmbH: *See—*
Bahring, Horst, 4,407,544., Cl. 297-362.000.

Profitt, James A.: *See—*
Ong, Helen H.; and Profitt, James A., 4,408,050., Cl. 546-17.000.

Propst, Paul L.; Richardson, Donald A.; and Hinrichs, Carl B., to Stow/Davis Furniture Company. Base construction for panel. 4,407,101., Cl. 52-126.300.

Protronix, Inc.: *See—*
Anderson, Dale L., 4,407,416., Cl. 211-41.000.

Protze, Dieter; and Voigt, Udo, to Volkswagenwerk AG. Longitudinally and angularly adjustable steering column. 4,407,166., Cl. 74-493.000.

Proud, Joseph M.: *See—*
Byszewski, Wojciech W.; Budinger, A. Bowman; and Proud, Joseph M., 4,408,141., Cl. 315-56.000.

Prox, Rolf, to Abex Corporation. Proximity sensing head. 4,408,159., Cl. 324-207.000.

Pruitt, Duard L., to RCA Corporation. DC-to-DC Switching converters. 4,408,267., Cl. 363-17.000.

Pryanishnikov, Igor S.: *See—*
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.

Pryor, Richard L., to RCA Corporation. Protection and anti-floating network for insulated-gate field-effect circuitry. 4,408,245., Cl. 361-56.000.

Pryor, Timothy R.; and Hageniers, Omer L., to Diffracto Ltd. High accuracy filling machines. 4,407,379., Cl. 177-52.000.

Purinton, Mark A.: *See—*
Haines, Roger W.; and Purinton, Mark A., 4,407,185., Cl. 98-1.500.

Purton, Robert M.: *See—*
Hanson, Lloyd D.; and Purton, Robert M., 4,407,327., Cl. 137-625.300.

Pusineri, Christian; and Goletto, Jean, to Hospal-Sodip, S.A. Mixtures of polymers for medical use. 4,408,026., Cl. 525-128.000.

Pyatibrat, Alexandr L.: *See—*
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.

Pyo, Kwan-sung; and Park, Moon-sung. Needlework toy. 4,407,090., Cl. 46-118.000.

Quantel S.A.: *See—*
Michelet, Guy A.; and Bret, Georges G., 4,407,567., Cl. 350-423.000.

R.C.S. Enterprises Limited: *See—*
Haigh, Harry; and Sonmor, Rudy C., 4,407,645., Cl. 418-131.000.

Raccach, Moshe, to Microlife Technics, Inc. Fermentation method using a selected lactobacillus. 4,407,828., Cl. 426-56.000.

Raceway Components, Inc.: *See—*
Kohaut, John E., 4,408,090., Cl. 174-48.000.

Rachor, Lothar: *See—*
Hrovat, Milan; Huschka, Hans; and Rachor, Lothar, 4,407,742., Cl. 252-628.000.

Raghu, Sivaraman, to American Cyanamid Company. Amido methoxyethylamines. 4,408,072., Cl. 564-185.000.

Rahl, Forrest J.: *See—*
Ulmer, Harry E.; Pickens, Donald; Rahl, Forrest J.; and Lefrancois, Philip A., 4,407,783., Cl. 423-347.000.

Rains, Louis: *See—*
MacDermott, Carl H.; and Brown, Richard S., Jr., 4,407,075., Cl. 33-348.200.

Raj, Kuldip; and Casciari, Raoul, to Ferrofluidics Corporation. Single-pole-piece ferrofluid seal apparatus and exclusion seal system. 4,407,508., Cl. 277-1.000.

Raj, Kuldip: *See—*
Moskowitz, Ronald; Raj, Kuldip; and Kern, James L., 4,407,518., Cl. 277-1.000.

Ralphs, George T., to C & J Clark Limited. Manufacture of shoes. 4,407,034., Cl. 12-142.0RS.

Ramco Steel, Inc.: *See—*
Rossberg, Shelton R., 4,407,055., Cl. 29-157.00R.

Raml, Walter: *See—*
Dobramysl, Wilhelm; Stern, Gerhard; and Raml, Walter, 4,408,045., Cl. 544-196.000.

Rampel, Guy, to General Electric Company. Electrode coating composed of copolymers derived from diacetone acrylamide. 4,407,913., Cl. 429-137.000.

Rapeli, Juha; and Leppavuori, Seppo. Component with trimmable electric impedance. 4,408,170., Cl. 333-172.000.

Rasmussen, Jorgen B., to Elsmark A/S. Process for transferring information and system for carrying out the process. 4,408,185., Cl. 340-310.00A.

Rasmussen, Ole-Bendt. High-strength laminate. 4,407,877., Cl. 428-105.000.

Rasmusson, Gary H.: *See—*
Graham, Donald W.; Rasmusson, Gary H.; and Tolman, Richard L., 4,407,802., Cl. 424-253.000.

Ratcliffe, Maurice J.; and Roberts, Thomas A., to Imperial Chemical Industries PLC. Dental compositions. 4,407,984., Cl. 523-115.000.

Rau, Harald: *See—*
Holtschmidt, Ulrich; Koerner, Gotz; Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,408,031., Cl. 528-26.000.

Raush, Russell G.; and Alleman, Raymond A., to RCA Corporation. Externally adjustable seal and bearing structure. 4,407,531., Cl. 285-158.000.

Ray, Roger E., to Westinghouse Electric Corp. Protective relay apparatus. 4,408,246., Cl. 361-64.000.

Raychem Limited: *See—*
Crofts, David, 4,407,888., Cl. 428-355.000.

Raywall Kommanditbolag: *See—*
Ekstrom, Lars A., 4,407,349., Cl. 160-98.000.

RCA Corporation: *See—*
Bell, Alan E., 4,408,213., Cl. 346-135.100.
Butterwick, Gilbert N., 4,407,857., Cl. 427-74.000.
Buzgo, Alexander W., 4,408,320., Cl. 369-290.000.
Fox, Stephen M., 4,407,469., Cl. 244-169.000.
Harford, Jack R., 4,408,229., Cl. 358-177.000.
Mehrotra, Gopi N.; and Van Arsdall, Gerald, 4,408,315., Cl. 369-71.000.
Pastore, David C., 4,408,240., Cl. 360-121.000.
Pruitt, Duard L., 4,408,267., Cl. 363-17.000.
Pryor, Richard L., 4,408,245., Cl. 361-56.000.
Raush, Russell G.; and Alleman, Raymond A., 4,407,531., Cl. 285-158.000.
Robbi, Anthony D.; and Sinniger, Joseph O., 4,408,296., Cl. 364-569.000.
Ruhland, Kim, 4,408,298., Cl. 364-717.000.
Theriault, Gerald E., 4,408,348., Cl. 455-180.000.

Reader, Philip: *See—*
Garner, Derek H.; Price, Frank C.; Reader, Philip; Whittingham, David W.; White, Anthony M.; Shutt, Joseph A.; and Campling, Nicholas J., 4,407,033., Cl. 12-10.100.

Recognition Equipment Incorporated: *See—*
McWaters, Lynn D.; and Sanner, Medford D., 4,408,344., Cl. 382-62.000.

Recreation Equipment Corp.: *See—*
Clore, Wayne G.; Norton, Charles T.; and Thompson, William P., 4,407,498., Cl. 273-1.50R.

Reeder, Gareld S., to Commonwealth Edison Co. Cross-arm brace. 4,407,601., Cl. 403-25.000.

Regnat, Karl, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Aircraft load lock, especially bomb lock including central operating means. 4,407,180., Cl. 89-1.50B.

Rehling, Walter; and Rossell, Jaime. Speed regulator for the warp beam of a weaving machine. 4,407,331., Cl. 139-110.000.

Reimert, Larry E., to Dril-Quip, Inc. Self-aligning connector assembly. 4,407,527., Cl. 285-27.000.

Reinberg, Alan R.: *See—*
Bruce, Richard H.; and Reinberg, Alan R., 4,407,850., Cl. 427-38.000.

Reiner, Barry C.; and DuRoss, Robert M., to SCM Corporation. Case shift and lock input mechanism including a shift control switch. 4,407,596., Cl. 400-253.000.

Reneau, Phillip G.: *See*—
Lyon, Lyndall W.; Reneau, Phillip G.; and Coppock, Paul G., 4,407,192., Cl. 101-7.000.

Renius, Karl T.: *See*—
Rosendahl, Peter; and Renius, Karl T., 4,407,401., Cl. 192-61.000.

Reon Manufacturing Company: *See*—
Hendry, Robert B., 4,407,173., Cl. 81-9.50R.

Research and Development Institute, Inc. at Montana State University, The: *See*—
Woodriff, Ray A., 4,407,582., Cl. 356-312.000.

Research Frontiers Incorporated: *See*—
Saxe, Robert L., 4,407,565., Cl. 350-374.000.

Resneau, Jean C.; Cirio, Marius; and Doyen, Jean, to Thomson-CSF. Device for connecting in parallel power transistors in very high frequency. 4,408,219., Cl. 357-80.000.

Restrepo, Jose M. Fiber-reinforced cement and process. 4,407,676., Cl. 106-88.000.

Return on Investment Corporation: *See*—
Hilton, Carl W.; and Bullard, Harold L., 4,407,385., Cl. 180-175.000.

Reuter, Edward J. Integral hinge covers for waste container. 4,407,427., Cl. 220-339.000.

Rey, Pierre; and Bonnet, Emile, to SEB S.A. Wrapper for kitchen utensils. 4,407,414., Cl. 206-553.000.

Reynolds, Francis D., to Grier, Dale C. Self-injecting syringe. 4,407,283., Cl. 128-218.00F.

Reynolds Metals Company: *See*—
Jensen, Eric L.; and Lee, Harry W., Jr., 4,407,340., Cl. 141-67.000.

Rheinmetall GmbH: *See*—
Boeder, Dieter; and Wiemers, Karl-Josef, 4,407,071., Cl. 33-178.00E.

Rhone-Poulenc Industries: *See*—
Foraison, Dominique; and Leveque, Alain, 4,407,780., Cl. 423-10.000.
Soula, Gerard; and Linguenheld, Louis, 4,408,075., Cl. 564-474.000.

Rhone-Poulenc Sante: *See*—
Cotrel, Claude; Farge, Daniel; and Taurand, Gerard, 4,407,797., Cl. 424-246.000.

Richard Ryan & Associates, Inc.: *See*—
Ryan, Richard B., 4,407,051., Cl. 24-369.000.

Richardson Chemical Company: *See*—
Mallory, Glenn O.; and Horhn, Theresa R., 4,407,869., Cl. 427-443.100.

Richardson, Donald A.: *See*—
Propst, Paul L.; Richardson, Donald A.; and Hinrichs, Carl B., 4,407,101., Cl. 52-126.300.

Richmond Tank Car Company: *See*—
Harbin, Wayne D.; Stark, Marvin; and Britt, Kenneth W., 4,407,203., Cl. 105-462.000.

Ricoh Co. Ltd.: *See*—
Horii, Shigeo, 4,407,872., Cl. 428-35.000.
Sakai, Katsuo, 4,407,917., Cl. 430-42.000.

Riedel, Kenneth A. Solar collector. 4,407,270., Cl. 126-450.000.

Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, to Chemische Werke Huls Aktiengesellschaft. Fire retardant particulate expandable styrene polymers. 4,407,977., Cl. 521-56.000.

Ripoll, Luis, to Stronghold International AG. Cable anchorage. 4,407,770., Cl. 264-69.000.

RIS Irrigation Systems: *See*—
Sargent, Ronald J., 4,407,455., Cl. 239-222.170.

Rise, William E.; and Masserang, Gregory J., to Android Corporation. Work transfer device. 4,407,404., Cl. 198-774.000.

Rise, William E., to Android Corporation. Work transfer device. 4,407,405., Cl. 198-774.000.

Rizkalla, Nabil, to Halcon SD Group, Inc., The. Preparation of carboxylic acids. 4,407,726., Cl. 502-161.000.

Roantree, Michael L.; and Young, Rodney C., to Smith Kline & French Laboratories Limited. 2-Heterocyclic alkylamino-3-nitropyrroles. 4,407,808., Cl. 424-263.000.

Robbi, Anthony D.; and Sinniger, Joseph O., to RCA Corporation. Digital timing system for spark advance. 4,408,296., Cl. 364-569.000.

Robert Bosch GmbH: *See*—
Bauer, Manfred, 4,407,253., Cl. 123-506.000.
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; and Rubrecht, Jens-Detlef, 4,408,289., Cl. 364-551.000.
Eheim, Franz, 4,407,245., Cl. 123-359.000.
Eheim, Franz, 4,407,249., Cl. 123-449.000.
Eheim, Franz; Hofer, Gerald; and Links, Heins, 4,407,250., Cl. 123-450.000.
Horbelt, Michael; Arnold, Herbert; and Winkelmann, Lothar, 4,407,156., Cl. 73-118.000.
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Kuhlmann, Gerhard, 4,407,615., Cl. 408-239.00A.
Ruf, Walter, 4,407,258., Cl. 123-617.000.
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Roberts, Thomas A.: *See*—
Ratcliffe, Maurice J.; and Roberts, Thomas A., 4,407,984., Cl. 523-115.000.

Robertshaw Controls Company: *See*—
Gunter, James C., 4,407,066., Cl. 29-882.000.

Robertson, Thomas A. Method and apparatus for supplying trawl. 4,407,088., Cl. 43-4.500.

Robin, Gerard: *See*—
Bricot, Claude; and Robin, Gerard, 4,407,646., Cl. 425-174.400.

Robin Hood Multifoods Inc.: *See*—
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Robinson, Joseph G.; and Brain, Sally A., to Coal Industry (Patents) Limited. Varnishes for glasscloth laminates, methods of their production and laminates made therefrom. 4,408,003., Cl. 524-364.000.

Robinson, Robert H.: *See*—
Dilliner, Monte M., 4,407,252., Cl. 123-504.000.

Rockwell International Corporation: *See*—
Dudding, Charles H., 4,408,352., Cl. 455-295.000.
Dumas, Theodore A., 4,408,208., Cl. 343-786.000.
Jones, Addison B., 4,407,859., Cl. 427-89.000.
Saetti, Giuseppe, 4,407,209., Cl. 112-147.000.
Thornton, Jack C.; and Russell, Randy G., 4,408,177., Cl. 336-139.000.

Roder, Thomas: *See*—
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Roehrs, Robert E.: *See*—
Schoenwald, Ronald D.; and Roehrs, Robert E., 4,407,792., Cl. 424-81.000.

Rogers, Dennis L.; and Widmer, Albert X., to International Business Machines Corporation. Current amplifier stage with diode interstage connection. 4,408,167., Cl. 330-261.000.

Rogers, Robert K.: *See*—
Steuer, Robert R.; Rogers, Robert K.; and Horne, Robert H., 4,407,295., Cl. 128-670.000.

Rohm and Haas Company: *See*—
Bartman, Benjamin; and Swift, Graham, 4,408,018., Cl. 525-300.000.

Rohr Industries, Inc.: *See*—
Timms, Richard H., 4,407,120., Cl. 60-226.200.

Rollins, Edward J. Cueing device. 4,408,187., Cl. 340-332.000.

Rolls-Royce Limited: *See*—
Kwan, William C. T., 4,407,128., Cl. 60-737.000.

Ronzon, Norbert: *See*—
Knebel, Werner; Ronzon, Norbert; and Weidner, Eugen, 4,407,444., Cl. 236-12.100.

Roobeek, Cornelis F.: *See*—
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 4,408,078., Cl. 568-454.000.

Roques, Bernard; and Lecomte, Jeanne-Marie, to Centre National de la Recherche Scientifique (CNRS). Peptides and therapeutic applications thereof. 4,407,794., Cl. 424-177.000.

Rosenberg, William J.; and Title, Alan M., to Lockheed Missiles & Space Co., Inc. Optical filter. 4,407,566., Cl. 350-404.000.

Rosendahl, Peter; and Renius, Karl T., to Klockner-Humboldt-Deutz Aktiengesellschaft. Hydrostatic coupling. 4,407,401., Cl. 192-61.000.

Ross, Robert E.; Fleckenstein, Lee J.; and Campbell, Michael E., to Eastman Kodak Company. Photographic products and processes employing substituted sulfonamidophenol or sulfonamidonaphthol dye-releasers. 4,407,930., Cl. 430-223.000.

Rossberg, Shelton R., to Ramco Steel, Inc. Method of making surface drainage culvert. 4,407,055., Cl. 29-157.00R.

Rossell, Jaime: *See*—
Rehling, Walter; and Rossell, Jaime, 4,407,331., Cl. 139-110.000.

Rossetti, Anthony J.: *See*—
Suarez, Joe R., Jr.; Schwartz, Henry L.; Rossetti, Anthony J.; and Corl, Paul D., 4,407,293., Cl. 128-660.000.

Rothrock, Phyllis C.: *See*—
Lathrop, Patrick J.; and Rothrock, Phyllis C., 4,407,840., Cl. 426-629.000.

Rousseau, Jean P. Key holder. 4,407,148., Cl. 70-456.00R.

Roussel Uclaf: *See*—
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Mendy, Francois, 4,407,821., Cl. 424-312.000.

Rovner, Jerry M.: *See*—
van Dijk, Christiaan P.; Solbakken, Aage; and Rovner, Jerry M., 4,407,973., Cl. 518-703.000.

Rozeboom, Henry, to International Harvester Co. Disk harrow with cushion gang. 4,407,372., Cl. 172-572.000.

Rubrecht, Jens-Detlef: *See*—
Boning, Bernward; Bone, Rainer; Nagel, Rudolf; and Rubrecht, Jens-Detlef, 4,408,289., Cl. 364-551.000.

Rudolph, Hans: *See*—
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Rudolph, Samuel A.: *See*—
Patel, Hiralal V.; and Rudolph, Samuel A., 4,407,532., Cl. 285-256.000.

Ruf, Walter, to Robert Bosch GmbH. Ignition and fuel injection pulse generating system for odd-numbered multi-cylinder internal combustion engine. 4,407,258., Cl. 123-617.000.

Rufer, Clemens: *See*—
Kirsch, Gerald; Kapp, Joachim-Friedrich; and Rufer, Clemens, 4,407,823., Cl. 424-317.000.

Ruhland, Kim, to RCA Corporation. Pseudo random number generator apparatus. 4,408,298., Cl. 364-717.000.

Rule, Charles E.; and Miller, Donald E., to SCM Corporation. Fluid non-dairy coffee whitener. 4,407,838., Cl. 426-602.000.

Russell, Larry R. Surface controlled blade stabilizer. 4,407,377., Cl. 175-325.000.

Russell, Randy G.: *See*—
Thornton, Jack C.; and Russell, Randy G., 4,408,177., Cl. 336-139.000.

Russell, Raymond J., to Panelographic Corporation. Method for forming an abrasion resistant coating from cellulose ester and pentaerythritol acrylates. 4,407,855., Cl. 427-54.100.

Ruti Machinery Works Ltd.: *See*—
Steiner, Alois, 4,407,336., Cl. 139-452.000.

Rutsky, Vladimir V.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.

Ryan, Richard B., to Richard Ryan & Associates, Inc. Slip-in drapery hook. 4,407,051., Cl. 24-369.000.

Sadaranganey, Gobind: *See*—
Corbeil, Roger; and Sadaranganey, Gobind, 4,407,839., Cl. 426-622.000.

Sadler, Fred S.; Hettwer, Paul F.; Viet, Vu H.; and Acker, Clarance R., to McGraw-Edison Company. Process for making electrical insulating paper and the product thereof. 4,407,697., Cl. 162-137.000.

Sadler, James L.: *See*—
Oakes, Thomas R.; and Sadler, James L., 4,407,790., Cl. 424-78.000.

Saetti, Giuseppe, to Rockwell International Corporation. Workpiece folding guide for cutting and sewing machines. 4,407,209., Cl. 112-147.000.

Saiger, Gunther: *See*—
Stift, Kurt; Sulzbacher, Horst; and Saiger, Gunther, 4,407,864., Cl. 427-216.000.

Saiji, Mitsuhiro: *See*—
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Saito, Atsunori; Naganoma, Masanori; Iwata, Yasuhiro; and Usami, Kiyoshi, to Nippondenso Co., Ltd. Electric control method for automobile air conditioner. 4,408,278., Cl. 364-424.000.

Saito, Hiroji, to Toshiba Kikai Kabushiki Kaisha. Injection molding machine. 4,407,649., Cl. 425-145.000.

Saito, Makoto: *See*—
Sawa, Shigeki; Nagasaka, Hiroyasu; Saito, Makoto; Mizuno, Masashi; and Kozima, Katuhiro, 4,407,682., Cl. 148-128.000.

Saito, Minoru: *See*—
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Saito, Takashi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus having a jacket opening enlarging device. 4,408,316., Cl. 369-77.200.

Sakai, Hiromu: *See*—
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Tsuchiko, Susumu; Tawara, Kazuo; and Yamasoba, Takahiko, 4,407,689., Cl. 156-243.000.

Sakai, Katsuo, to Ricoh Company, Ltd. Information image synthesizing and copying method. 4,407,917., Cl. 430-42.000.

Sakai, Toshiyasu: *See*—
Hara, Masahiro; Sakai, Toshiyasu; and Okamoto, Atsutoshi, 4,408,120., Cl. 235-462.000.

Sakaki, Tomohiko: *See*—
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Sakasai, Toshio: *See*—
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Sakuma, Shinzo; Umeya, Eiji; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, to Kabushiki Kaisha Meidensha. Vacuum interrupter. 4,408,107., Cl. 200-144.00B.

Sakurai, Junji, to Fujitsu Limited. Method of manufacturing a semiconductor device. 4,407,060., Cl. 29-576.00E.

Salemme, Charles T.: *See*—
Murphy, Guy C.; Jones, Jackie D.; and Salemme, Charles T., 4,407,885., Cl. 428-246.000.

Salvesen, Richard S., to Midwest Computer Register Corp. Digital counter/transmitter with remote receiver/display. 4,408,204., Cl. 340-870.240.

Salzburg, Herbert; Meyborg, Holger; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Process for the preparation of 1,4-3,6-dianhydrohexitols. 4,408,061., Cl. 549-464.000.

Sanborn, Dale. Dip tank hoist. 4,407,229., Cl. 118-702.000.

Sanders, James L. Ion-exchange system and method for isolation and determination of glycosylated hemoglobin in human blood. 4,407,961., Cl. 436-67.000.

Sandoz Ltd.: *See*—
Hiestand, Peter; and Strasser, Michael, 4,407,825., Cl. 424-336.000.
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,407,993., Cl. 524-96.000.
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,408,051., Cl. 546-19.000.

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Sano, Konosuke: *See*—
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Sano, Yasushi: *See*—
Sugiyama, Hiroyuki; Kaneda, Isami; Abe, Ryozo; Sakakibara, Susumu; and Sano, Yasushi, 4,408,312., Cl. 369-43.000.

Santos, Astrogildo, Sr. Power generating apparatus. 4,408,127., Cl. 290-54.000.

Sanyo Electric Co., Ltd.: *See*—
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Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
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Sapieha, Slawomir W.; and Wertheimer, Michael R. Electrets from plasma polymerized material. 4,407,852., Cl. 427-41.000.

Sargent, Ronald J., to RIS Irrigation Systems. Snap-in rotatable sprinkler. 4,407,455., Cl. 239-222.170.

Sari, Hikmet, to U.S. Philips Corporation. Adaptive system in a digital data receiver providing compensation for amplitude and phase distortions introduced by a data transmission channels. 4,408,332., Cl. 375-14.000.

Sasaki, Susumu; and Sakaki, Tomohiko. Smear sample preparing method. 4,407,843., Cl. 427-2.000.

Sasaki, Yoshitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of producing semiconductor device. 4,407,059., Cl. 29-571.000.

Sasaya, Kazushi; Degawa, Takashi; Suginuma, Atsushi; and Sato, Noriharu, to Hitachi, Ltd. Swash plate type compressor with silencer structure. 4,407,638., Cl. 417-269.000.

Satellite Business Systems: *See*—
Chadwick, Henry D.; and Matthews, David W., 4,408,322., Cl. 370-17.000.

Sato, Eiichi, to Olympus Optical Company Limited. Electrophotographic process and apparatus for making plural copies from a single image. 4,407,918., Cl. 430-54.000.

Sato, Hiroshi; Takatsu, Kei; and Isohata, Junji, to Canon Kabushiki Kaisha. Automatic wafer orienting apparatus. 4,407,627., Cl. 414-757.000.

Sato, Noriharu: *See*—
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Sato, Takashi: *See*—
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Sato, Yuichi: *See*—
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Sato, Yukihiro: *See*—
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Sauder, Peter: *See*—
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Sauerland, Franz L.: *See*—
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Saunders, Robert M.: *See*—
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Sawa, Shigeki; Nagasaka, Hiroyasu; Saito, Makoto; Mizuno, Masashi; and Kozima, Katuhiro, to Daido Tokushuko Kabushiki Kaisha. Method of plastic working of metal materials. 4,407,682., Cl. 148-128.000.

Sawamura, Keiichi, to Nissan Motor Company, Limited. Method of impregnating spheres of activated alumina for use in catalyst support with cerium. 4,407,735., Cl. 502-10.000.

Saxe, Robert L., to Research Frontiers Incorporated. Light valve suspension containing fluorocarbon liquid. 4,407,565., Cl. 350-374.000.

Sayegh, Marshall, to STA-TECH International, Inc. Energy control system. 4,407,447., Cl. 236-49.000.

Schaming, Edward J. Ionic strip coating method. 4,407,845., Cl. 427-13.000.

Scharf, Stephen, to Universal Brush Company Ltd. Pad drive for rotary scrubber. 4,407,040., Cl. 15-230.170.

Scherer, Albrecht: *See*—
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Schering Aktiengesellschaft: *See*—
Kirsch, Gerald; Kapp, Joachim-Friedrich; and Rufer, Clemens, 4,407,823., Cl. 424-317.000.

Schiff, Peter. Apparatus for left heart assist. 4,407,271., Cl. 128-1.00D.

Schindler, Hartmut: *See*—
Grozinger, Gerhard; Schindler, Hartmut; and Schmid, Franz, 4,408,118., Cl. 377-2.000.

Schink, Karl: *See*—
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Schlag, Johannes: *See*—
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Schlegel Corporation: *See*—
Dellevoet, John C., 4,407,219., Cl. 118-60.000.
Schlegel, Hans; Nowotny, Theodor; and Mayer, Rolf, to Wurttembergische Metallwarenfabrik AG. Tableware and decorative articles with a surface of silver. 4,407,875., Cl. 428-43.000.
Schlingmann, Gerhard: *See*—
Koppenhagen, Volker; Schlingmann, Gerhard; Dresow, Bernd; Bischoff, Ludwig; Penkert, Rosemarie; and Siefert, Eicke, 4,407,947., Cl. 435-85.000.
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Schmidt, Alfred J.; and Shearon, Michael H., to Du Pont de Nemours, E. I., and Company. On-line corner rounder. 4,407,177., Cl. 83-300.000.
Schmidt, Gunter, to Xonics, Inc. Compact X-ray unit. 4,408,339., Cl. 378-173.000.
Schmidt, Herbert: *See*—
Birkenstock, Udo; and Schmidt, Herbert, 4,407,733., Cl. 502-174.000.
Schmidt, Nelson: *See*—
Brune, Arlen G.; and Schmidt, Nelson, 4,407,111., Cl. 56-16.400.
Schmidt, Peter. Reclining platform for bathtub units. 4,407,029., Cl. 4-564.000.
Schmidt, Robert R.: *See*—
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Schmidt, Thomas; Timmler, Helmut; Bonse, Gerhard; Blank, Heinz U.; and Marzolph, Gerhard, to Bayer Aktiengesellschaft. Preparation of 3,6-disubstituted 4-amino-1,2,4-triazin-5-ones. 4,408,044., Cl. 544-182.000.
Schmidt, William K., to Du Pont de Nemours, E. I., and Company. Analgesic mixture of nalbuphine and indomethacin. 4,407,804., Cl. 424-260.000.
Schmidt, William K., to Du Pont de Nemours, E. I., and Company. Analgesic mixture of nalbuphine and zomepirac. 4,407,805., Cl. 424-260.000.
Schneider, Helga. Toilet seat lid cover. 4,407,024., Cl. 4-242.000.
Schneider, Hermann: *See*—
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,407,993., Cl. 524-96.000.
Hinsken, Hans; Mueller, Wolfgang; and Schneider, Hermann, 4,408,051., Cl. 546-19.000.
Schneider, Wolfangang; Peters, Josef; and Gaffal, Karl, to Klein, Schanzlin & Becker Aktiengesellschaft. Motor-pump aggregate. 4,407,631., Cl. 415-122.00R.
Schnur, Rodney C., to Pfizer Inc. Hypoglycemic 5-substituted oxazolidine-2,4-diones. 4,407,811., Cl. 424-272.000.
Schoenwald, Ronald D.; and Roehrs, Robert E., to Alcon Laboratories, Inc. Sustained release ophthalmic drug dosage. 4,407,792., Cl. 424-81.000.
Schopke, Holger: *See*—
Hoffman, Dietrich; and Schopke, Holger, 4,407,886., Cl. 428-320.800.
Schouteeten, Alain; and Christidis, Yani. Pure crystalline racemic sodium parahydroxymandelate, process for its preparation and uses thereof. 4,408,070., Cl. 562-470.000.
Schow, Steven R.: *See*—
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Schramme, Stephan H.; and Kelley, Mark A., to General Motors Corporation. Grommet assembly with panel attaching means. 4,407,042., Cl. 16-2.000.
Schreckenberg, Heinz: *See*—
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Schretzmann, Klaus; Dorner, Stefan; and Schumacher, Gustav, to Kernforschungszentrum Karlsruhe G.m.b.H. Method for preventing dangerous hydrogen accumulation in nuclear reactor containments. 4,407,774., Cl. 376-300.000.
Schroeder, James D., to Accu-Feed Corp. Conveyor with telescopic feed tube. 4,407,433., Cl. 222-63.000.
Schroeder, William S. Artificial erection device. 4,407,275., Cl. 128-79.000.
Schukei, Glen E.; and Formanek, Frank J., to Combustion Engineering, Inc. Sludge lance for nuclear steam generator. 4,407,236., Cl. 122-390.000.
Schultheiss, Dieter: *See*—
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Schulze, Rainer, to C. A. Weidmuller GmbH & Co. Tool for stripping electrical conductors. 4,407,174., Cl. 81-9.50A.
Schumacher, Gustav: *See*—
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Schumacher, Ignatius; and Wang, Kang-Bo, to Monsanto Company. Catalysts. 4,407,729., Cl. 502-200.000.
Schuman, Paul D.: *See*—
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Schwab, Bernard: *See*—
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Schwab, Helmut: *See*—
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Schwartz, Bertram: *See*—
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Schwarz, Rudolf; Kleinschmit, Peter; Liedtke, Christa; and Wolff, Siegfried, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Bis-(silylethyl)-oligosulphides and process for their production. 4,408,064., Cl. 556-427.000.
Schwarzler, Peter, to Krauss-Maffei AG. Asynchronous linear electric motor. 4,408,139., Cl. 310-13.000.
Schwinum, Ernst: *See*—
Perrey, Hermann; Matner, Martin; Schwinum, Ernst; and Rudolph, Hans, 4,407,724., Cl. 252-312.000.
Science Union Et Cie: *See*—
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SCM Corporation: *See*—
Reiner, Barry C.; and DuRoss, Robert M., 4,407,596., Cl. 400-253.000.
Rule, Charles E.; and Miller, Donald E., 4,407,838., Cl. 426-602.000.
Scott & Fetzer Company, The: *See*—
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Scripto, Inc.: *See*—
Muller, Frank A., 4,407,985., Cl. 523-161.000.
Seaborn, Douglas K., to Monsanto Company. Drawing and beaming a weftless warp of yarns. 4,407,767., Cl. 264-40.100.
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., to Nalco Chemical Company. Fluorocarbon surfactants. 4,408,043., Cl. 544-87.000.
SEB S.A.: *See*—
Rey, Pierre; and Bonnet, Emile, 4,407,414., Cl. 206-553.000.
SECO Industries, Inc.: *See*—
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Seeburg, Peter H.: *See*—
Goodman, Howard M.; Shine, John; and Seeburg, Peter H., 4,407,948., Cl. 435-91.000.
Seifert, Kurt, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,407,457., Cl. 239-533.120.
Seikosha Co., Ltd.: *See*—
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Semiconductor Research Foundation: *See*—
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Senshu, Hisashi; Ishikawa, Kazuhiro; Ishida, Yukihiko; and Kawagishi, Yoji, to Orient Chemical Industries, Ltd. Toner complexes for developing electrostatic images. 4,407,924., Cl. 430-109.000.
Sera, Hidefumi: *See*—
Naoi, Takashi; Kawasaki, Hiroshi; Yamaguchi, Jun; Tatsuta, Sumitaka; and Sera, Hidefumi, 4,407,939., Cl. 430-536.000.
Sestanj, Kazimir; Fung, Steven; Abraham, Nedumparambil A.; and Bellini, Francesco, to Ayerst, McKeena & Harrison, Inc. 6-(Lower alkoxy)-5-(trifluoromethyl)-1-naphthalenecarboxaldehydes. 4,408,077., Cl. 568-441.000.
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Seymour, Raymond K.; and Doughty, Dennis J., to General Electric Co. Accessory mounting module for J and K frame breakers. 4,408,174., Cl. 335-20.000.
Sghibartz, Cristian M., to International Paint Company Limited, The. Marine paint. 4,407,997., Cl. 524-202.000.
Shafer, Sheldon J.: *See*—
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Sharp Kabushiki Kaisha: *See*—
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Shearon, Michael H.: *See*—
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Shell Oil Company: *See*—
Baumgartner, Herman J., 4,408,082., Cl. 568-571.000.
Flint, Dennis H.; and Estreicher, Herbert, 4,407,671., Cl. 71-113.000.
Foster, Elton G., 4,408,081., Cl. 568-571.000.

Martin, Michael K., 4,408,017., Cl. 525-288.000.
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., 4,408,078., Cl. 568-454.000.
Sheludko, Alexey D.; Ivanov, Rumen V.; Nikolov, Dobrin V.; and Nishkov, Ivan M., to Institute Po Physikochimia pri Ban. Method of and apparatus for the flotation processing of minerals. 4,407,715., Cl. 209-164.000.
Shepard, Billy H. Method and composition for rapidly developing latent fingerprints. 4,407,842., Cl. 427-1.000.
Shepard, Joseph F.: *See*—
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Shepeleva, Irina S.: *See*—
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Shepherd, Ian C.; Pearson, Ian G.; and Gibson, Donald C., to Commonwealth Scientific and Industrial Research Organization. Grass mower. 4,407,112., Cl. 56-13.400.
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Shiau, Chin-Chih: *See*—
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Shibata, Tadashi: *See*—
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Shigematsu, Kazuo: *See*—
Terao, Motoyasu; Horigome, Shinkichi; Shigematsu, Kazuo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,407,880., Cl. 428-156.000.
Shikata, Osamu: *See*—
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Shima, George T., to Burroughs Corporation. Single transmission bus data network employing an expandable daisy-chained bus assignment control line. 4,408,300., Cl. 364-900.000.
Shima, Mutsuo; Aoyama, Kensuke; and Naka, Michiro, to Dai Nippon Insatsu Kabushiki Kaisha. Decorative sheets and processes for producing decorative articles by using the same. 4,407,881., Cl. 428-156.000.
Shimizu, Isao: *See*—
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Shinjo, Katsumi, to Yugen Kaisha Shinjoseisakusho. Drill screw. 4,407,620., Cl. 411-387.000.
Shintani, Kenji: *See*—
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Shintron Company, Inc.: *See*—
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Shipley, Randall S.; Lowery, Kirby, Jr.; and Gibbs, Ronald L., to Dow Chemical Company, The. Process for polymerizing olefins. 4,408,025., Cl. 526-119.000.
Shirai, Takayuki: *See*—
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Shiraki, Ryuzo: *See*—
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Shiraki, Yoshihiro; and Kojima, Tokumitsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Flashing apparatus of geothermal power plants. 4,407,127., Cl. 60-641.500.
Shiratori, Masayuki; and Katsura, Masaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Freon gas detecting element. 4,407,778., Cl. 422-90.000.
Shiryaev, Alexandr V.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.
Shogren, David K.; and Zambelli, Robert G., to Xerox Corporation. Compact optical scanning system. 4,407,581., Cl. 355-8.000.
Shomura, Koichi: *See*—
Toyoura, Masakazu; Shomura, Koichi; Tsuchida, Hirotoshi; and Murakami, Tadateru, 4,408,083., Cl. 568-576.000.
Shore, Daniel B.; and Chatterjea, Probir K., to Dresser Industries, Inc. Clutch-brake steering mechanism for tractors. 4,407,328., Cl. 137-625.600.
Short, Wilbur G.: *See*—
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Shultz, Nouelle A.: *See*—
Shultz, George W.; and Shultz, Nouelle A., 4,407,319., Cl. 135-87.000.
Shum, Lanson Y., to Westinghouse Electric Corp. Multi-arm robot. 4,407,625., Cl. 414-728.000.
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Sichling, Georg H.; Schwab, Helmut; and Schwab, Bernard, to Siemens Corporation. Fiber optical sensor device for measuring a physical parameter. 4,408,123., Cl. 250-226.000.
Siddens, Jack K., to American Cyanamid Company. Method for the preparation of difluoromethoxyaromatic compounds. 4,407,760., Cl. 260-465.00F.
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Siemens Aktiengesellschaft: *See*—
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Siemens Corporation: *See*—
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Signorini, Massimo; Trebbi, Attilio; and Moltesi, Luigi, to Dr. Lo. Zambeletti S.p.A. Process for preparing 1-(3,5-dimethoxy-4-hydroxy phenyl)-2-(N-methylamino) ethanol hydrochloride. 4,408,074., Cl. 564-361.000.
Signs by Severson Rent A Sign, Inc.: *See*—
Uihlein, Robert E.; and Severson, Walter C., 4,407,084., Cl. 40-475.000.
Sikorski, James A.; and Hoobler, Mary A., to Monsanto Company. Thiosulfenamide derivatives of N-phosphonomethylglycinonitriles. 4,407,763., Cl. 260-940.000.
Sikorski, James A.; and Hoobler, Mary A., to Monsanto Company. N-Arylsulfinyl N-phosphonomethylglycinonitriles. 4,407,764., Cl. 260-940.000.
Sillers, Donald A., Jr., to Peerless Manufacturing Company. Multiple filter vessel. 4,407,664., Cl. 55-357.000.
Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Arrangement for securing pure skew adjustment of a plate cylinder in a sheet-fed rotary printing press. 4,407,198., Cl. 101-248.000.
Simms, Graham J., to British Aerospace Public Limited Company. Ring laser gyroscopes. 4,407,583., Cl. 356-350.000.
Sincholle, Daniel: *See*—
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Singh, Shobha: *See*—
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Sinner, Bengt: *See*—
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Sipra Patententwicklungs Beteiligungsgesellschaft mbH: *See*—
Grozinger, Gerhard; Schindler, Hartmut; and Schmid, Franz, 4,408,118., Cl. 377-2.000.
Sirven, Jacques M. M. Hydraulic shock absorber having piston-mounted valve biased by gaseous pressure. 4,407,396., Cl. 188-282.000.
Sisson, Edwin D.; Morrow, Robert S.; Stoutenburg, Donn V.; and Davis, Dean T., to IRD Mechanalysis, Inc. Vibration analyzing apparatus and method. 4,408,285., Cl. 364-508.000.
Sitt, Rudiger: *See*—
Junge, Bodo; Stoltefuss, Jurgen; Muller, Lutz; Krause, Hans-Peter; and Sitt, Rudiger, 4,407,809., Cl. 424-267.000.
Sjolander, Einar. Method of manufacturing collagen products. 4,407,829., Cl. 426-59.000.
Skalsky, Michael: *See*—
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Small, Peter S.; and Small, Peter W., to Tonparo Limited. Separator device. 4,407,370., Cl. 171-124.000.

Small, Peter W.: *See*—
Small, Peter S.; and Small, Peter W., 4,407,370., Cl. 171-124.000.

Smart, John A., to Northern Petrochemical Company. Method of producing a textured film. 4,407,879., Cl. 428-141.000.

Smieskol, Stefan: *See*—
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Smith, Amos B., III; and Schow, Steven R., to University Patents, Inc. Spiroketals useful as intermediates in the synthesis of milbemycin and avermectin macrolides. 4,408,059., Cl. 549-214.000.

Smith, Arthur Albert, Jr.: *See*—
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Smith, Blaine M.; and Taylor, James A., to Ehrenreich Electronics, Inc. Sound actuated light switch. 4,408,308., Cl. 367-197.000.

Smith, Dean L., Jr.: *See*—
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Merchant, Philip, Jr.; and Smith, Dean L., Jr., 4,407,707., Cl. 204-190.000.

Smith, Dennis E., to Fisher & Paykel Limited. Belt drive system. 4,407,077., Cl. 34-108.000.

Smith Engineering: *See*—
Smith, Jay, III, 4,408,103., Cl. 200-6.00A.

Smith, George F., Jr., to Hergeth, Incorporated. Horizontal baling apparatus and method. 4,407,107., Cl. 53-528.000.

Smith, Glynn E.: *See*—
Cook, Clarence E.; Smith, Glynn E.; and Monaghan, Richard C., 4,407,686., Cl. 156-215.000.

Smith, Graydon E.; and Lewis, Barry J. Load-bearing hollow core base panel. 4,407,878., Cl. 428-119.000.

Smith International, Inc.: *See*—
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Thomas, Robert D., 4,407,378., Cl. 175-340.000.

Smith, Jay, III, to Smith Engineering. Joystick operated multiple position switch. 4,408,103., Cl. 200-6.00A.

Smith, John R.; Bingle, William D.; and Austin, Lowell W., to National Steel Corporation. Process for forming a drawn and ironed container. 4,407,149., Cl. 72-47.000.

Smith Kline & French Laboratories Limited: *See*—
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Smiths Industries Public Limited Company: *See*—
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Snaper, Alvin A. Air conditioning system. 4,407,134., Cl. 62-5.000.

Snow Brand Milk Products Co., Ltd.: *See*—
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Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
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Societe Anonyme dite Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
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Societe de Vente de l'Aluminium Pechiney: *See*—
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Societe Nationale Elf Aquitaine (Production): *See*—
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Societe Nationale Industrielle Aero.: *See*—
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Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Musy, Jean-Pierre, 4,407,586., Cl. 368-77.000.

Soejima, Shigeo: *See*—
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Solbakken, Aage: *See*—
van Dijk, Christiaan P.; Solbakken, Aage; and Rovner, Jerry M., 4,407,973., Cl. 518-703.000.

Sollner, George H.; Disque, Donny R.; and Knerr, Allan R., to Phelps Dodge Industries, Inc. Modified polyamide-imide resins and method for making the same. 4,408,032., Cl. 528-48.000.

Sonmor, Rudy C.: *See*—
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Sony Corporation: *See*—
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Sorensen, Ansgar C. H. Method for determining the concentration of an absorbable component in a gaseous mixture. 4,407,963., Cl. 436-147.000.

Sorenson, Richard W., to Carlingswitch, Inc. Pushbutton switch. 4,408,106., Cl. 200-68.000.

Soula, Gerard; and Linguenheld, Louis, to Rhone-Poulenc Industries. Process for the preparation of tris-(ether-amines) and the tris-(ether-amines) produced. 4,408,075., Cl. 564-474.000.

Soundcraft, Inc.: *See*—
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Southern Railway Company: *See*—
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Southwest Research Institute: *See*—
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Sowter, Brian R.: *See*—
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Spademan, Richard G. Ski boot locating apparatus. 4,407,520., Cl. 280-624.000.

Sparks, Daniel R.: *See*—
Voge, Andrew; Sparks, Daniel R.; and Mullins, Barry W., 4,408,252., Cl. 361-288.000.

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Sperry Corporation: *See*—
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Spiritini, Massimo; and Stiehler, Christoph, to Stiehler, Christoph. Method and device for laying roadmaking material in a roadway. 4,407,604., Cl. 404-75.000.

Spretnjak, Steve A.; and Anthony, Colin, to Excel Industries. Ventilating window. 4,407,093., Cl. 49-391.000.

Square D Company: *See*—
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STA-TECH International, Inc.: *See*—
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Staehle, Bradford G.: *See*—
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Staffa, Jeffrey A.: *See*—
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Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive mixture comprising O-naphthoquinone-diazides and light sensitive copying material prepared therefrom. 4,407,926., Cl. 430-165.000.

Stamicarbon BV: *See*—
Gaymans, Reinoud J.; and Bour, Edmond H. J. P., 4,408,036., Cl. 528-335.000.
Van Hardeveld, Rudolf, 4,408,046., Cl. 544-201.000.

Standard Manufacturing Company, Inc.: *See*—
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Standard Oil Company: *See*—
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Pedersen, S. Erik; Hardman, Harley F.; and Wagner, Louis F., 4,408,071., Cl. 562-536.000.
Weisrock, William P.; and McCarthy, Edward F., 4,407,950., Cl. 435-104.000.

Standard Oil Company, (Indiana): *See*—
Pellet, Regis J.; Gradassi, Michael J.; and Bertolacini, Ralph J., 4,407,736., Cl. 502-230.000.
Weisrock, William P.; and McCarthy, Edward F., 4,407,951., Cl. 435-104.000.

Standing, Colin A., to Gallagher Electronics Limited. Electric fence standard. 4,407,485., Cl. 256-10.000.

Stanford, James R.: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,408,043., Cl. 544-87.000.

Stark, Marvin: *See*—
Harbin, Wayne D.; Stark, Marvin; and Britt, Kenneth W., 4,407,203., Cl. 105-462.000.

Stark, Raymond L., to Alcon Laboratories, Inc. Ophthalmic solutions. 4,407,791., Cl. 424-80.000.

Startari, Joseph: *See*—
Wessells, Forrest; Startari, Joseph; and Estes, Michael E., 4,407,862., Cl. 427-144.000.

Stasko, Irene: *See*—
DeZeeuw, John R.; and Stasko, Irene, 4,407,953., Cl. 435-145.000.

Stauffer Chemical Company: *See*—
Aaronson, Alan M., 4,407,981., Cl. 521-107.000.
Chung, Frank H. Y., 4,407,835., Cl. 426-552.000.
Hardy, Thomas A., 4,407,765., Cl. 260-970.000.
Jung, Alfred K., 4,407,758., Cl. 260-429.900.
Wong, Rayman Y., 4,407,807., Cl. 424-263.000.

Stavinoha, Jerome L.; and McCollum, Anthony W., to Eastman Kodak Company. Polymer prepared from octadienol and unsaturated dicarboxylic acid, process of preparing the same, and coating composition prepared therefrom. 4,408,029., Cl. 526-321.000.

Stawitz, Josef: *See*—
Hohmann, Walter; and Stawitz, Josef, 4,408,056., Cl. 548-416.000.

Steel, James, to Ogden Electronics, Ltd. Collision prevention system. 4,407,388., Cl. 180-271.000.

Steffes, Michael A.: *See*—
Bushaw, Kenneth A.; Gillingham, Ronald D.; Jorgenson, Gary W.; Manning, Clyde L.; and Steffes, Michael A., 4,408,231., Cl. 358-280.000.
Stehouwer, William J., to A. J. Sparks. Tag. 4,407,082., Cl. 40-10.00C.
Steinback, Clarence I., to Acrometal Products, Inc. Method and apparatus for surface grinding. 4,407,096., Cl. 51-328.000.
Steinbuchel, Gunter H.: *See*—
Bruck, Herbert; Steinbuchel, Gunter H.; Hofmann, Hans; Busch, Josef; and Hoffacker, Franz, 4,407,867., Cl. 427-365.000.
Steiner, Alois, to Ruti Machinery Works Ltd. Thread-feed device for textile machines and method of operation. 4,407,336., Cl. 139-452.000.
Stemberger, Axel, to Dr. Ruhland Nachf. GmbH. Collagenous dressing. 4,407,787., Cl. 424-28.000.
Sterling Drug Inc.: *See*—
Teletzke, Gerald H.; and Erickson, Allen H., 4,407,717., Cl. 210-616.000.
Thompson, Joseph, 4,407,779., Cl. 422-266.000.
Stern, Gerhard: *See*—
Dobramysl, Wilhelm; Stern, Gerhard; and Raml, Walter, 4,408,045., Cl. 544-196.000.
Sternlicht, Mark, to Wonder Corporation of America. Disposable flashlight. 4,408,263., Cl. 362-189.000.
Steuer, Robert R.; Rogers, Robert K.; and Horne, Robert H., to DNA Medical, Inc. Miniature physiological monitor with interchangeable sensors. 4,407,295., Cl. 128-670.000.
Stevens, Frederick F.: *See*—
Hillberg, Robert L.; and Stevens, Frederick F., 4,407,085., Cl. 42-69.00R.
Stewart, David G.: *See*—
Ball, William J.; Palmer, Keith W.; and Stewart, David G., 4,407,728., Cl. 502-60.000.
Stichting Nederlands Instituut Voor Zuivelonderzoek (NIZO): *See*—
Lippe, Frank; Ottenhof, Henricus A. W. E. M.; and De Boer, Rudolf, 4,407,747., Cl. 260-120.000.
Stiehler, Christoph: *See*—
Spiritini, Massimo; and Stiehler, Christoph, 4,407,604., Cl. 404-75.000.
Stift, Kurt; Sulzbacher, Horst; and Saiger, Gunther, to Voest-Alpine Aktiengesellschaft. Process for treating iron sponge. 4,407,864., Cl. 427-216.000.
Stimpson, Flave F.: *See*—
Benton, Robert L.; Martinsons, Dainis O.; and Stimpson, Flave F., 4,407,511., Cl. 277-24.000.
Stohler, Harro: *See*—
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Stoltefuss, Jurgen: *See*—
Junge, Bodo; Stoltefuss, Jurgen; Muller, Lutz; Krause, Hans-Peter; and Sitt, Rudiger, 4,407,809., Cl. 424-267.000.
Stone, Harris E. Cap for a paper core. 4,407,428., Cl. 220-356.000.
Stonehart, Paul. Fuel cell with Pt/Pd electrocatalyst electrode. 4,407,906., Cl. 429-42.000.
Stoppani, Brian R., to Mining Supplies Limited. Mine system. 4,407,545., Cl. 299-30.000.
Storzer, Josef, to Ledermann GmbH & Co. Circular saw blades. 4,407,178., Cl. 83-835.000.
Stoutenburg, Donn V.: *See*—
Sisson, Edwin D.; Morrow, Robert S.; Stoutenburg, Donn V.; and Davis, Dean T., 4,408,285., Cl. 364-508.000.
Stow/Davis Furniture Company: *See*—
Propst, Paul L.; Richardson, Donald A.; and Hinrichs, Carl B., 4,407,101., Cl. 52-126.300.
Strasser, Karl: *See*—
Gutbier, Heinrich; Strasser, Karl; Limberg, Elmar; and Jensen, Volker, 4,407,903., Cl. 429-23.000.
Strasser, Michael: *See*—
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Straw, John E.: *See*—
Watson, William H.; and Straw, John E., 4,407,442., Cl. 229-28.00R.
Streisinger, Erwin, to C. R. Bard, Inc. Disc membrane catheter for performing cystometrograms and urethral profiles. 4,407,301., Cl. 128-774.000.
Stronghold International AG: *See*—
Ripoll, Luis, 4,407,770., Cl. 264-69.000.
Stroup, Norman G.: *See*—
Swanson, William C.; Krukow, Eugene J.; and Stroup, Norman G., 4,407,109., Cl. 56-11.900.
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., to Hoechst-Roussel Pharmaceuticals Inc. (4-Piperidyl)-substituted phenyl ketones. 4,408,053., Cl. 546-226.000.
Strupczewski, Joseph T.; Gardner, Beth A.; and Allen, Richard C., to Hoechst-Roussel Pharmaceuticals Inc. Oximes of 4-benzoyl-piperidines. 4,408,054., Cl. 546-226.000.
Stuever, Joseph H., to Sierra Survival Company, Inc. Stick. 4,407,318., Cl. 135-66.000.
Suarez, Joe R., Jr.; Schwartz, Henry L.; Rossetti, Anthony J.; and Corl, Paul D., to Diasonics, Inc. Ultrasound imaging apparatus for providing simultaneous B-scan and Doppler data. 4,407,293., Cl. 128-660.000.
Such, Christopher H.: *See*—
Hall, Derrard M.; Kemp, Roy A.; and Such, Christopher H., 4,407,990., Cl. 524-38.000.
Suchy, Jan B.: *See*—
Bennett, Everett W.; and Suchy, Jan B., 4,407,921., Cl. 430-96.000.
Suckow, David S., to Caterpillar Tractor Co. Multi-piece wheel structure. 4,407,348., Cl. 152-410.000.
Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Weible, Reinhold, 4,408,244., Cl. 361-24.000.
Sudoh, Kanzaburo: *See*—
Ichiyanagi, Toshikazu; Sudoh, Kanzaburo; Ogawa, Keisuke; and Yamazaki, Nobuhiro, 4,407,652., Cl. 432-58.000.
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Muellejans, Herbert; and Koetz, Hans-Joachim, 4,407,358., Cl. 165-166.000.
Sugi, Norio: *See*—
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Sugihara, Kazuyoshi: *See*—
Tojo, Toru; Sugihara, Kazuyoshi; Hata, Shuntaro; Numaga, Hirooki; Mukooyama, Haruhisa; and Suzuki, Yoshio, 4,408,126., Cl. 250-442.100.
Sugimoto, Koichi: *See*—
Kikuchi, Hiroshi; and Sugimoto, Koichi, 4,408,286., Cl. 364-513.000.
Sugimoto, Naohiko; Maekawa, Yukio; and Ichikawa, Yasunori, to Fuji Photo Film Co., Ltd. Silver halide photographic sensitive element containing a fluorine containing compound as an antistatic agent. 4,407,937., Cl. 430-527.000.
Suginaka, Shunji; Kobayashi, Ryuichiro; Ikeuchi, Satoru; Mizukura, Noboru; and Fujita, Noriko, to Konishiroku Photo Industry Co., Ltd. Photographic element with pyrazole electron donors. 4,407,941., Cl. 430-566.000.
Suginuma, Atsushi: *See*—
Sasaya, Kazushi; Degawa, Takashi; Suginuma, Atsushi; and Sato, Noriharu, 4,407,638., Cl. 417-269.000.
Sugiura, Yutaka, to Canon Kabushiki Kaisha. Magnetic sheet mounting device. 4,408,318., Cl. 369-261.000.
Sugiyama, Hiroyuki; Kaneda, Isami; Abe, Ryozo; Sakakibara, Susumu; and Sano, Yasushi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus with a tracking control defeating circuit for rapid track access. 4,408,312., Cl. 369-43.000.
Sugo, Takanobu: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,407,846., Cl. 427-35.000.
Sukejima, Hajime: *See*—
Nakayama, Yasuharu; Iwai, Hiroshi; and Sukejima, Hajime, 4,408,028., Cl. 526-200.000.
Sulowski, Andrew C.: *See*—
Greenway, Peter R.; Sulowski, Andrew C.; and George, Henry C., 4,407,391., Cl. 182-9.000.
Sulzbacher, Horst: *See*—
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Sulzer Brothers Limited: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Fukasawa, Akira; Yoshimura, Masakatsu; Kaneoya, Tatsuo; and Takahashi, Kenji, 4,407,756., Cl. 260-378.000.
Matsushima, Shunsuke; Hata, Kazuhiko; Mashita, Kentaro; Kanagawa, Shuichi; Nakao, Shinji; Nakai, Kiyoshi; and Kamio, Kunimasa, 4,408,086., Cl. 568-719.000.
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Sumitomo Electric Industries Ltd.: *See*—
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Sumitomo Special Metals, Ltd.: *See*—
Suzuki, Kikuo, 4,407,776., Cl. 420-477.000.
Sundeen, Arthur R., to General Motors Corporation. Engine operation related event timing system. 4,407,155., Cl. 73-116.000.
Sundstrand Data Control, Inc.: *See*—
Lukes, Henry J., 4,408,144., Cl. 318-7.000.
Sunsearch, Inc.: *See*—
Hopper, Thomas P., 4,407,269., Cl. 126-442.000.
Suozzo, Leonard S. Mechanical shock and sway arrestor. 4,407,395., Cl. 188-134.000.
Superthermal, Inc.: *See*—
Turner, Jesse R., 4,408,116., Cl. 219-273.000.
Supra Products, Inc.: *See*—
Larson, Wayne F., 4,407,147., Cl. 70-365.000.
Suroff, Hyman. Energy saving ice skate attachment device. 4,407,522., Cl. 280-809.000.
Sutcliffe, Gordon R.; Warden, Stephen J.; and Humpherson, Donald, to Imi Kynoch Limited. Methods of producing superconductors. 4,407,062., Cl. 29-599.000.
Sutoh, Shinji: *See*—
Takishita, Takashi; Sutoh, Shinji; Tanaka, Noriyuki; Kobayashi, Takashi; and Furukawa, Kenji, 4,407,354., Cl. 165-42.000.
Sutton, Ernest S.: *See*—
Biddle, Richard A.; Vriesen, Calvin W.; and Sutton, Ernest S., 4,407,119., Cl. 60-219.000.
Suvorova, Elena G.: *See*—
Gorbacheva, Irina N.; Kozinda, Zinaida J.; Suvorova, Elena G.; Chertov, Viktor A.; Dvoskin, Semen I.; Platonova, Evdokia V.; Podgaevskaya, Tatyana A.; and Skvirenko, Andrei B., 4,407,748., Cl. 260-153.000.
Suzuki, Junichi; and Shintani, Kenji, to Sony Corporation. Optical tracking apparatus. 4,408,311., Cl. 369-43.000.

Suzuki, Kikuo, to Sumitomo Special Metals, Ltd. Shape memory alloys. 4,407,776., Cl. 420-477.000.

Suzuki Metal Industry Co., Ltd.: *See—*
Nakamura, Tstomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, 4,407,353., Cl. 165-39.000.

Suzuki, Mitsuyuki: *See—*
Yamanaka, Minoru; Suzuki, Mitsuyuki; Haneda, Hideo; Kato, Masatoshi; and Ohtsuki, Masataka, 4,407,448., Cl. 236-88.000.

Suzuki, Nobukazu: *See—*
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Suzuki, Tadashi: *See—*
Nishino, Atsushi; Suzuki, Tadashi; Ikeda, Masaki; and Ohtani, Tadashi, 4,408,253., Cl. 361-293.000.

Suzuki, Yasuo: *See—*
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Suzuki, Yoshio: *See—*
Tojo, Toru; Sugihara, Kazuyoshi; Hata, Shuntaro; Numaga, Hirooki; Mukooyama, Haruhisa; and Suzuki, Yoshio, 4,408,126., Cl. 250-442.100.

Swanson, William C.; Krukow, Eugene J.; and Stroup, Norman G., to International Harvester Co. Hydraulic circuit for lifting the reel of an agricultural harvester. 4,407,109., Cl. 56-11.900.

Swartz, Mitchell R. Method and apparatus for generating superoxide and hydroxyl ions in solution. 4,407,282., Cl. 128-207.210.

Swartz, William E., to Nutrisearch Company. Whey protein fortified fish and process for preparation. 4,407,831., Cl. 426-281.000.

Swartz, William E., to Nutrisearch Company. Whey protein fortified red meat and process for preparation. 4,407,833., Cl. 426-281.000.

Swenson, Rita, to International Paper Company. Plastic sack holder. 4,407,474., Cl. 248-97.000.

Swift, Graham: *See—*
Bartman, Benjamin; and Swift, Graham, 4,408,018., Cl. 525-300.000.

Swift, Stephen J.: *See—*
Nappholz, Tibor A.; and Swift, Stephen J., 4,407,289., Cl. 128-419.0PG.

Sybron Corporation: *See—*
Cowell, David, 4,408,247., Cl. 361-79.000.
DeGraff, Harold F., Jr., 4,407,958., Cl. 435-287.000.

Synchro-Start Products, Inc.: *See—*
Neyer, James U., 4,407,517., Cl. 277-212.0FB.

Synergistics Chemicals Limited: *See—*
Crocker, Zenas; and Wise, David V., 4,407,987., Cl. 523-322.000.

Szala, Lawrence E.: *See—*
Lee, Minyoung; and Szala, Lawrence E., 4,407,968., Cl. 501-87.000.

Szippl, Andrew F.; and Walker, Robert B., to Lima Electric Co., Inc., The. Single phase, self-regulated alternator. 4,408,152., Cl. 322-29.000.

T. Goldschmidt AG: *See—*
Holtschmidt, Ulrich; Koerner, Gotz; Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,408,031., Cl. 528-26.000.

T. J. Electronics, Inc.: *See—*
Holman, Howard E., 4,407,529., Cl. 285-82.000.

Tabacco, Alessandro; and Tarli, Paolo, to Istituto Sieroteropico E. Vaccinogeno Toscano "Sclavo" S.p.A. Composition for the colorimetric determination of metals. 4,407,962., Cl. 436-74.000.

Tabata, Toshio: *See—*
Yashiro, Kenji; and Tabata, Toshio, 4,408,345., Cl. 455-3.000.

Tachiuchi, Tsuguji: *See—*
Komatsu, Shigeru; Nagai, Kunihiko; Koyama, Takuo; Tachiuchi, Tsuguji; and Hirahata, Shigeru, 4,408,197., Cl. 340-720.000.

Tack, Carl E., Jr.; and Heiberger, Francis E., to Danly Machine Corporation. Control system for synchronizing multiple presses in a line. 4,408,281., Cl. 364-476.000.

Tadahiro, Ohmi: *See—*
Nishizawa, Jun-ichi; Tadahiro, Ohmi; and Tamamushi, Takashige, 4,408,304., Cl. 365-174.000.

Taft, Darwin O.; and Van Siclen, Howard E., Jr., to Bendix Corporation, The. Method and apparatus for controlling an ignition system. 4,407,257., Cl. 123-612.000.

Tagawa, Tohru: *See—*
Fushiki, Takeshi; Tagawa, Tohru; and Kawakami, Satoru, 4,407,999., Cl. 524-276.000.

Taiho Kogyo Co., Ltd.: *See—*
Takenaka, Akira; and Fukuoka, Tatsuhiko, 4,407,513., Cl. 277-96.100.

Tajima, Fujio; Ichikawa, Atsushi; and Shimizu, Isao, to Hitachi, Ltd. Web drive apparatus. 4,407,462., Cl. 242-184.000.

Tajima, Tsunemitsu: *See—*
Murayama, Tetsuo; Otsuka, Shigenori; Tajima, Tsunemitsu; and Sato, Yukihiro, 4,407,919., Cl. 430-58.000.

Tajiri, Yasuhisa: *See—*
Hara, Tomihiro; Ogawa, Masahiro; Yamashita, Masaaki; and Tajiri, Yasuhisa, 4,407,899., Cl. 428-626.000.

Takada, Shigetaka: *See—*
Takeuchi, Yuzo; Kimura, Toshihide; and Takada, Shigetaka, 4,407,248., Cl. 123-439.000.

Takada, Syun: *See—*
Nakamura, Shinichi; Kadowaki, Takashi; Okumura, Mitsuhiro; and Takada, Syun, 4,407,940., Cl. 430-546.000.

Takagi, Satoshi: *See—*
Takahashi, Yuji; Hayashi, Hideki; Takagi, Satoshi; and Yukio, Ito, 4,408,237., Cl. 360-96.300.

Takahashi, Kenji: *See—*
Fukasawa, Akira; Yoshimura, Masakatsu; Kaneoya, Tatsuo; and Takahashi, Kenji, 4,407,756., Cl. 260-378.000.

Takahashi, Seiichi: *See—*
Iijima, Tetsuya; and Takahashi, Seiichi, 4,407,446., Cl. 236-49.000.

Takahashi, Yuji; Hayashi, Hideki; Takagi, Satoshi; and Yukio, Ito, to Clarion Co., Ltd. Magnetic record/playback apparatus. 4,408,237., Cl. 360-96.300.

Takamaru, Ken: *See—*
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Takamura, Tsutomu; Sato, Yuichi; Nakamura, Toshiaki; and Suzuki, Nobukazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Air electrode. 4,407,907., Cl. 429-42.000.

Takano, Suwaji: *See—*
Enokimoto, Akito; Tsuchiya, Toshio; Masuda, Tatsuo; and Takano, Suwaji, 4,407,383., Cl. 180-54.00E.

Takano, Toshimasa; Mukai, Hideo; and Hosoya, Masahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing apparatus. 4,407,228., Cl. 118-651.000.

Takano, Toshimasa: *See—*
Hashimoto, Shinichi; Takano, Toshimasa; and Mukai, Hideo, 4,407,580., Cl. 355-3.0TR.

Takao, Hiroshi: *See—*
Kimura, Shinji; Takao, Hiroshi; Ambe, Satoshi; and Akimune, Yoshio, 4,407,057., Cl. 29-570.000.

Takao, Hiroyoshi; and Inoue, Yoshio, to Sumitomo Chemical Company, Limited. Process for the separation treatment of polymer from polymer solution. 4,407,989., Cl. 523-340.000.

Takao, Nobuyuki: *See—*
Kitamura, Tadanori; and Takao, Nobuyuki, 4,407,866., Cl. 427-221.000.

Takasu, Shigetoshi: *See—*
Nakamura, Tstomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, 4,407,353., Cl. 165-39.000.

Takatsu, Kei: *See—*
Sato, Hiroshi; Takatsu, Kei; and Isohata, Junji, 4,407,627., Cl. 414-757.000.

Takatsuka, Keizo; Yamamoto, Hiroshi; and Baba, Toshihiro, to Mutsubishi Denki Kabushiki Kaisha. Puffer type gas interrupter. 4,408,108., Cl. 200-148.00A.

Takeda Chemical Industries, Ltd.: *See—*
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, 4,408,052., Cl. 546-22.000.
Kazama, Seiji; and Tanaka, Michio, 4,408,034., Cl. 528-54.000.
Morimoto, Hiroshi; Imada, Isuke; Watanabe, Masazumi; and Kawada, Mitsuru, 4,407,757., Cl. 260-413.000.

Takenaka, Akira; and Fukuoka, Tatsuhiko, to Taiho Kogyo Co., Ltd. Mechanical seal. 4,407,513., Cl. 277-96.100.

Takeuchi, Masato: *See—*
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.

Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, to Hitachi, Ltd. Fuel cell. 4,407,905., Cl. 429-42.000.

Takeuchi, Takashi; and Kobari, Harukuni, to Hitachi, Ltd.; and Victor Company of Japan, Ltd. Circuit for correcting error in digital information signal. 4,408,326., Cl. 371-38.000.

Takeuchi, Yuzo; Kimura, Toshihide; and Takada, Shigetaka, to Aisan Kogyo Kabushiki Kaisha. Electronically controlled carburetor. 4,407,248., Cl. 123-439.000.

Takeyama, Kojiro; and Shimotake, Toru, to Matsushita Electric Industrial Co., Ltd. Drive system for rotary drum type dehydrating apparatus. 4,407,078., Cl. 34-133.000.

Takishita, Takashi; Sutoh, Shinji; Tanaka, Noriyuki; Kobayashi, Takashi; and Furukawa, Kenji, to Diesel Kiki Company, Ltd. Vehicle temperature control apparatus. 4,407,354., Cl. 165-42.000.

Takubo, Takayuki, to Victor Company of Japan, Limited. Shouldering aid for a portable television camera. 4,407,437., Cl. 224-270.000.

Tamamushi, Takashige: *See—*
Nishizawa, Jun-ichi; Tadahiro, Ohmi; and Tamamushi, Takashige, 4,408,304., Cl. 365-174.000.

Tamaru, Munetaka: *See—*
Ohno, Hideshi; Kume, Kazunari; Osaka, Takatoshi; Nishimura, Katsuo; Tamaru, Munetaka; and Ode, Sadao, 4,407,590., Cl. 368-204.000.

Tamura, Katsuyoshi; and Kanai, Hiromi, to Hitachi, Ltd. Photosensor array device. 4,408,230., Cl. 358-213.000.

Tamura, Kohki: *See—*
Takeuchi, Seizi; Ishii, Kenzo; Kahara, Toshiki; Imahashi, Jinichi; Takeuchi, Masato; Okada, Hideo; Okabe, Sigeru; Matsuda, Shimpei; Nakajima, Fumito; Tobita, Hirosi; and Tamura, Kohki, 4,407,905., Cl. 429-42.000.

Tan, Randy J.: *See—*
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Tanahashi, Toshio: *See—*
Akagi, Motonobu; Tanahashi, Toshio; and Kato, Kichiro, 4,407,244., Cl. 123-339.000.

Tanaka, Kenji; and Endo, Shigeru, to Nisshin Flour Milling Co., Ltd. Method for the production of bread. 4,407,827., Cl. 426-19.000.

Tanaka, Michio: *See*—
Kazama, Seiji; and Tanaka, Michio, 4,408,034., Cl. 528-54.000.
Tanaka, Noriyuki: *See*—
Takishita, Takashi; Sutoh, Shinji; Tanaka, Noriyuki; Kobayashi, Takashi; and Furukawa, Kenji, 4,407,354., Cl. 165-42.000.
Tanaka, Takayoshi: *See*—
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Tanaka, Toshio, to Alps Electric Co., Ltd. Seesaw switch. 4,408,105., Cl. 200-68.000.
Taneda, Kozo: *See*—
Nakamura, Tstomu; Nakamoto, Takashi; Asada, Tatuo; Taneda, Kozo; Oshiro, Mitsuo; Takasu, Shigetoshi; and Kurihara, Masao, 4,407,353., Cl. 165-39.000.
Tanenbaum, Joseph M. Electrical resistance welding method and apparatus for same; and improved apparatus for testing welds. 4,408,115., Cl. 219-119.000.
Tanikawa, Eiki: *See*—
Tsunoda, Taiji; Nishio, Takashi; and Tanikawa, Eiki, 4,408,319., Cl. 369-275.000.
Tanso, Shiro: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,407,846., Cl. 427-35.000.
Tarli, Paolo: *See*—
Tabacco, Alessandro; and Tarli, Paolo, 4,407,962., Cl. 436-74.000.
Tateoka, Kiyoshi: *See*—
Ando, Hiromi; and Tateoka, Kiyoshi, 4,407,184., Cl. 91-376.00R.
Tatsuta, Sumitaka: *See*—
Naoi, Takashi; Kawasaki, Hiroshi; Yamaguchi, Jun; Tatsuta, Sumitaka; and Sera, Hidefumi, 4,407,939., Cl. 430-536.000.
Taurand, Gerard: *See*—
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Tawara, Kazuo: *See*—
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Taylor, James A.: *See*—
Smith, Blaine M.; and Taylor, James A., 4,408,308., Cl. 367-197.000.
Taylor, Thomas L.: *See*—
Newton, Jimmy D., 4,407,499., Cl. 273-54.00B.
TDK Electronics Co., Ltd.: *See*—
Akino, Tadaharu; Nakamura, Akira; and Uemura, Hiroyuki, 4,408,171., Cl. 333-177.000.
Technicare Corporation: *See*—
Vilkomerson, David H. R., 4,407,294., Cl. 128-660.000.
Technion Research & Development Foundation Ltd.: *See*—
Etsion, Izhak, 4,407,509., Cl. 277-3.000.
Teijin Limited: *See*—
Kadokura, Sadao; Tomie, Takashi; and Naoe, Masahiko, 4,407,894., Cl. 428-457.000.
Yamaguchi, Taturo; and Minemura, Norihiro, 4,407,848., Cl. 427-36.000.
Teijin Seiki Company, Limited: *See*—
Fukui, Kiyozumi, 4,407,170., Cl. 74-805.000.
Telectronics Pty., Ltd.: *See*—
Hirshorn, Michael S.; Holley, Loraine K.; and Skalsky, Michael, 4,407,302., Cl. 128-784.000.
Nappholz, Tibor A.; and Swift, Stephen J., 4,407,289., Cl. 128-419.0PG.
Teledyne Industries, Inc.: *See*—
Mills, Gary L.; and Bowen, B. Dean, 4,407,486., Cl. 266-87.000.
Teletype Corporation: *See*—
Hoschett, Albert M., 4,407,556., Cl. 339-91.00R.
Teletzke, Gerald H.; and Erickson, Allen H., to Sterling Drug Inc. Wastewater treatment process. 4,407,717., Cl. 210-616.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,408,042., Cl. 544-22.000.
Teraji, Tsutomu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Nakai, Yoshiharu; Sakane, Kazuo; and Goto, Jiro, 4,407,798., Cl. 424-246.000.
Terao, Motoyasu; Horigome, Shinkichi; Shigematsu, Kazuo; Miyamura, Yoshinori; and Yonezawa, Seiji, to Hitachi, Ltd. Substrate of member for recording information with light and method of manufacturing the same. 4,407,880., Cl. 428-156.000.
Terry, Michael B., to Mostek Corporation. Current supplementation circuit for power supply. 4,408,153., Cl. 323-224.000.
Terry, Vincent G., Jr., to General Electric Company. Insulated coupling. 4,407,602., Cl. 403-336.000.
Teshima, Takashi: *See*—
Miyakawa, Nobuhiro; Fujii, Masanori; Maekawa, Kouzi; Koyama, Haruo; and Teshima, Takashi, 4,407,923., Cl. 430-106.600.
Texaco Inc.: *See*—
Estes, John H., 4,407,782., Cl. 423-328.000.
Texas Instruments Incorporated: *See*—
Ash, Darrell L., 4,408,347., Cl. 455-179.000.
Baboian, Robert; and Haynes, Gardner, 4,407,711., Cl. 204-196.000.
Harris, Ralph A., 4,408,307., Cl. 367-79.000.
Levine, Jules D., 4,407,320., Cl. 136-250.000.
Theodosiou, George E.; and Dawson, John W. Reduction in maximum time uncertainty of paired time signals. 4,408,297., Cl. 364-569.000.
Theriault, Gerald E., to RCA Corporation. Multiband tuning system for a television receiver. 4,408,348., Cl. 455-180.000.
Thiele, Hartmut; Schmelter, Dieter; and Posch, Rainer, to Agfa-Gevaert Aktiengesellschaft. Plastics spool container for magnetic tapes. 4,407,412., Cl. 206-404.000.
Thiokol Corporation: *See*—
Biddle, Richard A.; Vriesen, Calvin W.; and Sutton, Ernest S., 4,407,119., Cl. 60-219.000.
Thomas, Robert D., to Smith International, Inc. Nozzle retention method for rock bits. 4,407,378., Cl. 175-340.000.
Thomas, Thomas H. Process for improving the tonal quality of stringed instruments. 4,407,181., Cl. 84-275.000.
Thompson, Daniel L.: *See*—
Thompson, Darrow; and Thompson, Daniel L., 4,407,466., Cl. 244-17.110.
Thompson, Darrow; and Thompson, Daniel L., to Overseas International Distributors Company B.V. Jet nozzle rotary wing aircraft. 4,407,466., Cl. 244-17.110.
Thompson, David F.: *See*—
Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., 4,407,635., Cl. 416-230.000.
Thompson, David M. Turnbuckle boot cover. 4,407,600., Cl. 403-23.000.
Thompson, Joseph, to Sterling Drug Inc. Dispersion control device. 4,407,779., Cl. 422-266.000.
Thompson, Leonard K., to Continental Disc Corporation. Capacitive pressure relief rupture disc monitor. 4,408,194., Cl. 340-626.000.
Thompson, Ricky D., to General Motors Corporation. Commutator assembly with hook members. 4,408,140., Cl. 310-234.000.
Thompson, William P.: *See*—
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Thomson-Brandt: *See*—
Bricot, Claude; and Robin, Gerard, 4,407,646., Cl. 425-174.400.
Thomson-CSF: *See*—
Pham Van Cang, Luc, 4,408,337., Cl. 377-44.000.
Resneau, Jean C.; Cirio, Marius; and Doyen, Jean, 4,408,219., Cl. 357-80.000.
Urien, Jacques; and Vidal Sainte Andre, Bruno, 4,408,209., Cl. 343-861.000.
Val, Christian, 4,408,256., Cl. 361-403.000.
Thorn, Olov, to Pax Electro Products AB. Settable shutter device. 4,407,188., Cl. 98-116.000.
Thornton, Jack C.; and Russell, Randy G., to Rockwell International Corporation. Variable inductor having extended useable frequency range. 4,408,177., Cl. 336-139.000.
Thorp, Sidney: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,407,830., Cl. 426-272.000.
Thrift, Peter R., to Smiths Industries Public Limited Company. Electrical connector assemblies for capacitive fluid-gauging probes. 4,407,558., Cl. 339-121.000.
Thyssengas GmbH: *See*—
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Timms, Richard H., to Rohr Industries, Inc. Thrust reverser geared linkage. 4,407,120., Cl. 60-226.200.
Timokhina, Valeria I.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.
Titanseal Corporation: *See*—
McLaughlin, James A., 4,407,099., Cl. 52-202.000.
Title, Alan M.: *See*—
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Tkachenko, Sergei S.: *See*—
Akimova, Alla Y.; Davydov, Anatoly B.; Derkach, Galina M.; Timokhina, Valeria I.; Tkachenko, Sergei S.; Rutsky, Vladimir V.; Volkov, Mstislav V.; Shepeleva, Irina S.; Shiryaev, Alexandr V.; Lipkin, Semen I.; and Musyanovich, Vladimir M., 4,407,793., Cl. 424-81.000.
Tobita, Hirosi: *See*—
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Toda, Setsuo. Work feed method in a press. 4,407,630., Cl. 414-786.000.
Tojo, Toru; Sugihara, Kazuyoshi; Hata, Shuntaro; Numaga, Hirooki; Mukooyama, Haruhisa; and Suzuki, Yoshio, to Toshiba Machine Co., Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Cassette retaining device of electron beam apparatus. 4,408,126., Cl. 250-442.100.
Tokico Ltd.: *See*—
Ando, Hiromi; and Tateoka, Kiyoshi, 4,407,184., Cl. 91-376.00R.
Tokita, Hideki: *See*—
Watanabe, Kazuo; Tokita, Hideki; and Nakajima, Koe, 4,407,056., Cl. 29-527.700.
Tokoy Shibaura Denki Kabushiki Kaisha: *See*—
Ishii, Jun, 4,408,184., Cl. 340-365.00S.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hashimoto, Shinichi; Takano, Toshimasa; and Mukai, Hideo, 4,407,580., Cl. 355-3.0TR.
Ide, Yuuichi; and Nukushina, Harunobu, 4,407,139., Cl. 62-215.000.

Iida, Kazuhiko, 4,408,301., Cl. 364-900.000.
Koike, Yoshiyasu; Kubo, Osamu; Ido, Tadashi; and Uwaha, Masanobu, 4,407,721., Cl. 252-62.590.
Komatsu, Michiyasu; Tsuge, Akihiko; and Ota, Hiroyasu, 4,407,970., Cl. 501-97.000.
Komatsu, Michiyasu; Tsuge, Akihiko; and Ohta, Hiroyasu, 4,407,971., Cl. 501-97.000.
Kurosawa, Kei; and Shibata, Tadashi, 4,407,851., Cl. 427-39.000.
Kuwahara, Hisao, 4,408,132., Cl. 307-359.000.
Nagano, Katsumi, 4,408,190., Cl. 340-347.0DA.
Nakayama, Naoto, 4,408,181., Cl. 82-61.000.
Nishibe, Shinji, 4,408,276., Cl. 364-200.000.
Sasaki, Yoshitaka, 4,407,059., Cl. 29-571.000.
Shiraki, Yoshihiro; and Kojima, Tokumitsu, 4,407,127., Cl. 60-641.500.
Shiratori, Masayuki; and Katsura, Masaki, 4,407,778., Cl. 422-90.000.
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Takano, Toshimasa; Mukai, Hideo; and Hosoya, Masahiro, 4,407,228., Cl. 118-651.000.
Tojo, Toru; Sugihara, Kazuyoshi; Hata, Shuntaro; Numaga, Hirooki; Mukooyama, Haruhisa; and Suzuki, Yoshio, 4,408,126., Cl. 250-442.100.
Yokota, Tsuneshi, 4,408,314., Cl. 369-46.000.
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Tolman, Richard L.: *See*—
Graham, Donald W.; Rasmusson, Gary H.; and Tolman, Richard L., 4,407,802., Cl. 424-253.000.
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L. Device for abrasive cleaning of blanks shaped as bodies of revolution. 4,407,095., Cl. 51-112.000.
Tomasek, Josef: *See*—
Kahovec, Jaroslav; Matejka, Zdenek; and Tomasek, Josef, 4,407,978., Cl. 521-56.000.
Tomie, Takashi: *See*—
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Tomino, Naoki; and Tsukamoto, Masaaki, to Nippon Kogaku K.K. Camera with focal plane shutter. 4,407,574., Cl. 354-50.000.
Tomisawa, Susumu. Spool holding device. 4,407,461., Cl. 242-134.000.
Tomita, Tadashi: *See*—
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Tomiyama, Akira: *See*—
Tomiyama, Tsuyoshi; and Tomiyama, Akira, 4,407,816., Cl. 424-275.000.
Tomiyama, Tsuyoshi; and Tomiyama, Akira, to Kotobuki Seiyaku Company Limited. 3-Substituted-2-propenimidamides and method of manufacturing the same. 4,407,816., Cl. 424-275.000.
Tonaevsky, Ernst L.: *See*—
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.
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Tones, John, to Northern Engineering Industries plc. Axial-flow steam turbine wheel. 4,407,634., Cl. 416-196.00R.
Tonparo Limited: *See*—
Small, Peter S.; and Small, Peter W., 4,407,370., Cl. 171-124.000.
Torbeck, Daniel J., to Monarch Marking Systems, Inc. Hand-held electrically selectable labeler. 4,407,692., Cl. 156-350.000.
Toreson, James S.: *See*—
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Toriyama, Hideoki: *See*—
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Hunter, Edwin J., 4,407,451., Cl. 239-66.000.
Tosco Corporation: *See*—
Nutter, John F., 4,407,653., Cl. 432-215.000.
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Toshiba Machine Co., Ltd.: *See*—
Tojo, Toru; Sugihara, Kazuyoshi; Hata, Shuntaro; Numaga, Hirooki; Mukooyama, Haruhisa; and Suzuki, Yoshio, 4,408,126., Cl. 250-442.100.
Toshiba Pharmaceutical Co., Ltd.: *See*—
Yui, Tohru; Hirai, Hachiro; and Takamaru, Ken, 4,407,863., Cl. 427-213.000.
Toso Kabushiki Kaisha: *See*—
Nakamura, Toshihiro, 4,407,350., Cl. 160-178.00R.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Tsuchiko, Susumu; Tawara, Kazuo; and Yamasoba, Takahiko, 4,407,689., Cl. 156-243.000.
Toyo Rubber Industry Co., Ltd., The: *See*—
Kunihiro, Motoo; Atsumi, Tomiaki; Kuse, Kazumasa; and Ishigaki, Masahiro, 4,407,491., Cl. 267-140.100.
Toyoda, Yukio: *See*—
Kobayashi, Hiroyuki; Ohki, Yoshimasa; Toyoda, Yukio; and Akasaki, Isamu, 4,408,217., Cl. 357-17.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
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Kato, Keigo; and Kuroiwa, Yosio, 4,407,254., Cl. 123-549.000.
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Kunihiro, Motoo; Atsumi, Tomiaki; Kuse, Kazumasa; and Ishigaki, Masahiro, 4,407,491., Cl. 267-140.100.
Toyoura, Masakazu; Shomura, Koichi; Tsuchida, Hirotoshi; and Murakami, Tadateru, to Mitsui Petrochemical Industries, Ltd. Method of treating hydroperoxide mixtures. 4,408,083., Cl. 568-576.000.
Trammell, W. Edgar; Young, James E.; Chidester, James R.; and Walker, Ralph S. Disposable hood. 4,407,280., Cl. 128-205.260.
Transac-Alcatel-Compagnie pour le Development des Transactions Automatiques: *See*—
Decavele, Dominique, 4,408,119., Cl. 235-382.000.
Transat Corp.: *See*—
Bennett, Emeric S.; and Sauerland, Franz L., 4,407,094., Cl. 51-165.00R.
TransData, Inc.: *See*—
Kovalchik, Donald P.; and Battocletti, Frank E., 4,408,283., Cl. 364-483.000.
Tratnyek, Joseph P., to American Sterilizer Company. Visual chemical indicating composition for monitoring sterilization. 4,407,960., Cl. 436-1.000.
Trautenberg, Elmar: *See*—
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Trautlein, Ray W., to Lem Products, Inc. Durable data-tag with record duplication. 4,407,524., Cl. 282-9.00R.
Trebbi, Attilio: *See*—
Signorini, Massimo; Trebbi, Attilio; and Molteni, Luigi, 4,408,074., Cl. 564-361.000.
Trimmer, James E.; and Worley, Ross W., to Precise Forms, Inc. Textured brick form. 4,407,480., Cl. 249-189.000.
Tripp, Mary: *See*—
Drake, Cyril F.; and Tripp, Mary, 4,407,786., Cl. 424-14.000.
Triumph-Adler A.G. fur Buround Informationstechnik: *See*—
Link, Manfred, 4,407,594., Cl. 400-212.000.
Troika Corp.: *See*—
Hendershot, Robert V., 4,407,598., Cl. 403-4.000.
Trotta, Robert A., to Gillette Company, The. Shaving implement. 4,407,067., Cl. 30-50.000.
Trukenbrod, Karl: *See*—
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,407,977., Cl. 521-56.000.
TRW Inc.: *See*—
Grimes, Richard V.; Harlamert, W. Benjamin; and Thompson, David F., 4,407,635., Cl. 416-230.000.
Trytek, Joseph J., to John Crane-Houdaille, Inc. High pressure rotary mechanical seal. 4,407,512., Cl. 277-96.100.
Tsai, Boh C.: *See*—
Farrell, Christopher J.; Tsai, Boh C.; and Wachtel, James A., 4,407,897., Cl. 428-516.000.
Tschernezky, Wladimir. Apparatus for inhalation. 4,407,279., Cl. 128-200.110.
Tseng, Shin-Shyong, to American Cyanamid Company. Novel N,N'-bis(trifluoromethylsulfonyl)oxamides and chemiluminescent compositions containing the same. 4,407,743., Cl. 252-700.000.
Tsentralny Nauchno-Issledovatelsky Institut: *See*—
Gorbacheva, Irina N.; Kozinda, Zinaida J.; Suvorova, Elena G.; Chertov, Viktor A.; Dvoskin, Semen I.; Platonova, Evdokia V.; Podgaevskaya, Tatyana A.; and Skvirenko, Andrei B., 4,407,748., Cl. 260-153.000.
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Tsuchida, Takayasu; and Sano, Konosuke, to Ajinomoto Company Incorporated. Method for producing L-phenylalanine by fermentation. 4,407,952., Cl. 435-108.000.
Tsuchiko, Susumu: *See*—
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Tsuchiya, Tadashi: *See*—
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Tsuji, Nobuhiko; Nakamura, Keijiroh; Endoh, Koichi; Hamada, Toshiyoshi; and Ishida, Keiichi, to Fuji Electric Co., Ltd. Blood sugar analyzing apparatus. 4,407,959., Cl. 435-288.000.
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Tsujii, Masahiko: *See—*
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Tsunoda, Taiji; Nishio, Takashi; and Tanikawa, Eiki, to Pioneer Electronic Corporation. Optical information recording mother disc and method of producing the same. 4,408,319., Cl. 369-275.000.
Tsutsumi, Yasuyuki: *See—*
Uozumi, Norihira; Yamagata, Takeo; Yasukawa, Saburo; Tsutsumi, Yasuyuki; and Ono, Seiichiro, 4,407,904., Cl. 429-26.000.
Tullis, Barclay J.; Tan, Randy J.; and McKeon, John F., to FMC Corporation. Boundary plane warning system. 4,408,195., Cl. 340-685.000.
Tune, John B.: *See—*
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Turk, Stanley D.: *See—*
Drake, Charles A.; and Turk, Stanley D., 4,408,037., Cl. 528-346.000.
Turner, Jesse R., to Superthermal, Inc. Superheated steam generator. 4,408,116., Cl. 219-273.000.
Tyndale Plains-Hunter, Ltd.: *See—*
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Tyner, David A.: *See—*
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Uchino, Shoichi: *See—*
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Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, to Eisai Co., Ltd. Heptacosapeptide. 4,407,745., Cl. 260-112.50R.
Ueda, Minoru: *See—*
Inohara, Shizuo; Masuda, Mitsuya; Iyehara, Sadahiro; Ueda, Minoru; and Yamamoto, Keisuke, 4,408,143., Cl. 315-366.000.
Uemura, Hiroyuki: *See—*
Akino, Tadaharu; Nakamura, Akira; and Uemura, Hiroyuki, 4,408,171., Cl. 333-177.000.
Uihlein, Robert E.; and Severson, Walter C., to Signs by Severson Rent A Sign, Inc. Apparatus for storing a plurality of signs and automatically displaying said signs at predetermined timed intervals. 4,407,084., Cl. 40-475.000.
Ulmer, Harry E.; Pickens, Donald; Rahl, Forrest J.; and Lefrancois, Philip A., to Allied Corporation. Producing silane from silicon tetrafluoride. 4,407,783., Cl. 423-347.000.
Umeya, Eiji: *See—*
Sakuma, Shinzo; Umeya, Eiji; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,408,107., Cl. 200-144.00B.
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Lundstrom, Eric A., 4,408,334., Cl. 372-98.000.
U.S. Philips Corporation: *See—*
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Uozumi, Norihira; Yamagata, Takeo; Yasukawa, Saburo; Tsutsumi, Yasuyuki; and Ono, Seiichiro, to Hitachi, Ltd.; and Hitachi Chemical Company, Ltd. Fuel cell. 4,407,904., Cl. 429-26.000.
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van Dijk, Christiaan P.; Solbakken, Asge; and Rovner, Jerry M., to M. W. Kellogg Company, The. Methanol from coal and natural gas. 4,407,973., Cl. 518-703.000.
Van Doorn, Donald W.; Webb, Tommy W.; and Hawkins, James B., to Lummus Industries, Inc. Cotton ginning system embodying a lint cleaner and process of operating the same. 4,407,047., Cl. 19-64.500.
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Van Hardeveld, Rudolf, to Stamicarbon, B.V. Process of preparing melamine. 4,408,046., Cl. 544-201.000.
Vanier, Noel R., to Eastman Kodak Company. Use of ketal blocked quinones to reduce post-process D_{min} increase in positive redox dye-releasing image transfer systems. 4,407,928., Cl. 430-214.000.
Van Leeuwen, Petrus W. N. M.; and Roobeek, Cornelis F., to Shell Oil Company. Process for the hydroformylation of olefins. 4,408,078., Cl. 568-454.000.
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Ventura, Gerard V. Combined coin saver, counter and wrapper. 4,407,313., Cl. 133-8.00A.
Ventura, Gerard V. Combined coin saver, counter and wrapper. 4,407,314., Cl. 133-8.00A.
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Virkar, Anil V.; and Miller, Gerald R., to Ceramatec, Inc.; and University of Utah. Electrochemical cell utilizing molten alkali metal electrode-reactant. 4,407,912., Cl. 429-104.000.
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Wadensten, Theodore S. Vibratory belt cleaning apparatus for an endless conveyor. 4,407,403., Cl. 198-494.000.
Wagener, Dietrich; Fach, Horst; Sauder, Peter; and Abel, Otto, to Didier Engineering GmbH. Apparatus for treating gases produced from coal. 4,407,701., Cl. 202-99.000.
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Wahl, Helmut; and Hofmeister, Hagen, to Licentia Patent-Verwaltungs-GmbH. Method and circuit for synchronization. 4,408,327., Cl. 371-47.000.
Wakabayashi, Hiroshi; Kazami, Kazuyuki; Ohtsubo, Yoshiaki; and Akasaka, Shigeo, to Nippon Kogaku K.K. Pop up flash device control for a camera. 4,407,573., Cl. 354-33.000.
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Wallussek, Heinz; Wiebe, Martin; and Roder, Thomas, to Bergwerksverband GmbH. Device for controlling the orientation of bore holes. 4,407,374., Cl. 175-24.000.
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Washizuka, Isamu; and Saiji, Mitsuhiro, to Sharp Kabushiki Kaisha. Sound or voice responsive timepiece. 4,408,096., Cl. 381-107.000.
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Watanabe, Masazumi: *See—*
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Waugh, Robert E., to D. L. Auld Company, The; and D. L. Auld Company, The. Glass container having means for reducing breakage and shattering. 4,407,421., Cl. 215-12.00R.
Weaver, Max A.; Coates, Clarence A., Jr.; and Fisher, John G., to Eastman Kodak Company. AZO Dyes from 2-sulfonated, sulfated or thiosulfated organothiothiadiazole and aniline, tetrahydroquinoline, or benzomorpholine couplers. 4,407,749., Cl. 260-155.000.
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Weisrock, William P.; and McCarthy, Edward F., to Standard Oil Company. *Xanthomonas campestris* ATCC 31602 and process for use. 4,407,950., Cl. 435-104.000.
Weisrock, William P.; and McCarthy, Edward F., to Standard Oil Company (Indiana). *Xanthomonas campestris* ATCC 31600 and process for use. 4,407,951., Cl. 435-104.000.
Weitemeyer, Christian: *See—*
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Wessel, Ulrich; and Scherer, Albrecht, to Klockner-Humboldt-Deutz AG (Branch Establishment Fahr). Haymaking machine. 4,407,115., Cl. 56-370.000.
Wessells, Forrest; Startari, Joseph; and Estes, Michael E., to W. R. Grace & Co. Method of making letterpress printing plates. 4,407,862., Cl. 427-144.000.
Western Electric Company, Inc.: *See—*
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Wheatley, Nigel J.; and Andrews, Martyn P., to Plessey Overseas Limited. Memory protection system using capability registers. 4,408,274., Cl. 364-200.000.
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Massey, Billy G., 4,407,454., Cl. 239-154.000.
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Garner, Derek H.; Price, Frank C.; Reader, Philip; Whittingham, David W.; White, Anthony M.; Shutt, Joseph A.; and Campling, Nicholas J., 4,407,033., Cl. 12-10.100.
Widener, Joseph; Britt, James M.; and LaPrade, Steve A., to Babcock & Wilcox Company, The. Flexible refractory composition. 4,407,969., Cl. 501-95.000.
Widmer, Albert X.: *See—*
Rogers, Dennis L.; and Widmer, Albert X., 4,408,167., Cl. 330-261.000.
Wiebe, Martin: *See—*
Wallussek, Heinz; Wiebe, Martin; and Roder, Thomas, 4,407,374., Cl. 175-24.000.
Wiechmann, Karl-Ernst, to Klockner-Werke Aktiengesellschaft. Transport system for flat metallic materials in strip mills. 4,407,438., Cl. 226-15.000.
Wieder, Wolfgang: *See—*
Hocker, Jurgen; Wieder, Wolfgang; and Dhein, Rolf, 4,408,027., Cl. 526-185.000.
Wiemers, Karl-Josef: *See—*
Boeder, Dieter; and Wiemers, Karl-Josef, 4,407,071., Cl. 33-178.00E.
Wienhofer, Ekkehard: *See—*
Rigler, Josef K.; Wienhofer, Ekkehard; Leithauser, Horst; and Trukenbrod, Karl, 4,407,977., Cl. 521-56.000.
Wilber, Scott A., to Biox Technology, Inc. Blood constituent measuring device and method. 4,407,290., Cl. 128-633.000.
Wilde, Sheldon L.; McCandless, Thomas J.; and Saunders, Robert M., to H-C Industries, Inc. Composite closure. 4,407,422., Cl. 215-246.000.
Wiley, Lawrence G.: *See—*
Bowen, Terry P.; Lawrence, George J.; and Wiley, Lawrence G., 4,408,353., Cl. 455-608.000.
Wilger, John A.: *See—*
Allori, Aldo; Wilger, John A.; and Voss, Julian D., 4,407,394., Cl. 188-71.400.
Wilhelm, Raymond L., to Brunswick Corporation. Valve actuating mechanism. 4,407,326., Cl. 137-553.000.
Wilje, Sven O. E. Device for the control of the luminous flux from a main beam bulb in a motor vehicle. 4,408,142., Cl. 315-82.000.
Wilkinson, Richard F., Sr.: *See—*
Wilkinson, William R.; and Wilkinson, Richard F., Sr., 4,407,777., Cl. 422-46.000.
Wilkinson, William H., to Battelle Development Corporation. Cogeneration energy balancing system. 4,407,131., Cl. 60-648.000.
Wilkinson, William R.; and Wilkinson, Richard F., Sr. Blood oxygenator. 4,407,777., Cl. 422-46.000.
Williams, Michael. Electrical adapter. 4,407,560., Cl. 339-154.00L.
Williams, Ronald A.: *See—*
Nevens, Charles; and Williams, Ronald A., 4,407,660., Cl. 604-6.000.
Willis, Clyde A.; and Lingafelter, Jerry K., to Walker-Neer Mfg. Co., Inc. Collapsible pedestal for drilling apparatus. 4,407,373., Cl. 173-141.000.
Willis, Clyde A., to Walker-Neer Manufacturing Co., Inc. Lifting apparatus for down-hole tubulars. 4,407,629., Cl. 414-745.000.
Wills, Milton H., Jr., to Martin Marietta Corporation. Concrete masonry units incorporating cement kiln dust. 4,407,677., Cl. 106-97.000.
Wills, Paul E., to Du Pont de Nemours, E. I., and Company. Stabilization of zinc-containing coating compositions. 4,408,002., Cl. 524-357.000.
Wills, Thomas A. Exercise monitoring device. 4,408,183., Cl. 340-323.00R.
Wilmsmann, Hans-Peter; and Koch, Fritz E., to Dr. Franz & Rutenbeck. Clamping device for self-supporting electric cables. 4,407,471., Cl. 248-63.000.
Wilski, Hans; Interthal, Werner; and Engelhardt, Friedrich, to Hoechst Aktiengesellschaft. Drag reducing agents. 4,407,321., Cl. 137-13.000.

Wilson, Charles R.: *See*—
Eskinazi, Victoria; Kirner, John F.; and Wilson, Charles R., 4,407,738., Cl. 502-334.000.

Wilson, David N.: *See*—
Matthews, Bernard T.; Benstead, Alan J.; Joll, David J.; Thorp, Sidney; and Wilson, David N., 4,407,830., Cl. 426-272.000.

Wilson, Ronald A. Multi-purpose exercise apparatus. 4,407,495., Cl. 272-117.000.

Wilson, Timothy W. Hair cutter with vacuum. 4,407,068., Cl. 30-133.000.

Wingender, Kaspar: *See*—
Boie, Immo; and Wingender, Kaspar, 4,407,929., Cl. 430-220.000.

Winkelmann, Lothar: *See*—
Horbelt, Michael; Arnold, Herbert; and Winkelmann, Lothar, 4,407,156., Cl. 73-118.000.

Wirtgen, Reinhard. Method and apparatus for repairing longitudinal seams or cracks in road surfaces. 4,407,605., Cl. 404-77.000.

Wirz, Gustav; and Pizzagalli, Franco, to Les Fabriques d'Assortiments Reunies S.A. Wafer dicing apparatus. 4,407,262., Cl. 125-13.00R.

Wise, David V.: *See*—
Crocker, Zenas; and Wise, David V., 4,407,987., Cl. 523-322.000.

Witt, Alvin E., to PermaGrain Products, Inc. Stain-resistant earthen articles. 4,407,884., Cl. 428-220.000.

Wolf, Ronald J., to Wabash, Inc. Capacitor discharge ignition system and method of manufacture thereof. 4,407,256., Cl. 123-599.000.

Wolfe, John J. Frosted condiment holder. 4,407,143., Cl. 62-303.000.

Wolff, Friedrich, to O&K Orenstein & Koppel Aktiengesellschaft. Two-speed transmission with hydraulic actuation of the shifting operations under load. 4,407,399., Cl. 192-4.00A.

Wolff, Siegfried: *See*—
Schwarz, Rudolf; Kleinschmit, Peter; Liedtke, Christa; and Wolff, Siegfried, 4,408,064., Cl. 556-427.000.

Wonder Corporation of America: *See*—
Sternlicht, Mark, 4,408,263., Cl. 362-189.000.

Wong, Rayman Y., to Stauffer Chemical Company. Pyridylpropyl cycloalkanecarboxylates: insect repellents. 4,407,807., Cl. 424-263.000.

Wood, Kenneth E.: *See*—
Lovelace, Alan M.; and Wood, Kenneth E., 4,407,165., Cl. 73-862.540.

Woodriff, Ray A., to Research and Development Institute, Inc. at Montana State University, The. Method and apparatus for reduction of matric interference in electrothermal atomizer for atomic absorption spectroscopy. 4,407,582., Cl. 356-312.000.

Worley, Ross W.: *See*—
Trimmer, James E.; and Worley, Ross W., 4,407,480., Cl. 249-189.000.

Wormly, Thaddaues H. Toilet paper storage dispenser. 4,407,459., Cl. 242-55.530.

Worms, Karl-Heinz: *See*—
Blum, Helmut; and Worms, Karl-Heinz, 4,407,761., Cl. 260-502.50C.

Woudstra, Nico, to B.V. Neratoom. Nuclear reactor installation. 4,407,773., Cl. 376-299.000.

Wright, Stanley, to Precision Automation Co., Inc. Poultry cutting apparatus. 4,407,046., Cl. 17-11.000.

Wurster, Rudolf F.: *See*—
Merz, Jurg; Wegmuller, Hans; and Wurster, Rudolf F., 4,407,976., Cl. 521-36.000.

Wurttembergische Metallwarenfabrik AG: *See*—
Schlegel, Hans; Nowotny, Theodor; and Mayer, Rolf, 4,407,875., Cl. 428-43.000.

Wysocki, Joseph A., to Hughes Aircraft Company. Metallic clad fiber optical waveguide. 4,407,561., Cl. 350-96.300.

Wytaniec, Casimir S. Apparatus and method for detecting an interface from a remote location. 4,407,159., Cl. 73-290.00R.

Xerox Corporation: *See*—
Grushkin, Bernard; and Bertrand, Jacques C., 4,407,922., Cl. 430-98.000.
Lee, Lieng-Huang; and Landry, Deborah N., 4,407,920., Cl. 430-59.000.
Liebman, Alan J., 4,407,925., Cl. 430-122.000.
Shogren, David K.; and Zambelli, Robert G., 4,407,581., Cl. 355-8.000.

Xonics, Inc.: *See*—
Schmidt, Gunter, 4,408,339., Cl. 378-173.000.

Yamada, Takahiro, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Ink-jet recording device featuring separating of large and small droplets. 4,408,211., Cl. 346-75.000.

Yamada, Yasuyuki: *See*—
Miyatsuka, Hajime; Kasuga, Akira; and Yamada, Yasuyuki, 4,407,901., Cl. 428-694.000.

Yamagata, Takeo: *See*—
Uozumi, Norihira; Yamagata, Takeo; Yasukawa, Saburo; Tsutsumi, Yasuyuki; and Ono, Seiichiro, 4,407,904., Cl. 429-26.000.

Yamaguchi, Akihiro; Yamaguchi, Keizaburo; and Murakami, Hisamichi, to Mitsui Toatsu Chemicals, Incorporated. Heat sensitive recording sheet. 4,407,892., Cl. 428-411.000.

Yamaguchi, Jun: *See*—
Naoi, Takashi; Kawasaki, Hiroshi; Yamaguchi, Jun; Tatsuta, Sumitaka; and Sera, Hidefumi, 4,407,939., Cl. 430-536.000.

Yamaguchi, Keizaburo: *See*—
Yamaguchi, Akihiro; Yamaguchi, Keizaburo; and Murakami, Hisamichi, 4,407,892., Cl. 428-411.000.

Yamaguchi, Taturo; and Minemura, Norihiro, to Teijin Limited. Process for durably modifying a shaped synthetic polymer article. 4,407,848., Cl. 427-36.000.

Yamaguchi, Tatuya, to Olympus Optical Co., Ltd. Endoscope system with means for detecting auxiliary apparatuses. 4,407,272., Cl. 128-6.000.

Yamaguchi, Tomohiko, to Agency of Industrial Science and Technology. Polymeric membrane having maleic anhydride residues. 4,407,975., Cl. 521-27.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yasui, Toshihiro; and Warnke, Wayne L., 4,407,386., Cl. 180-193.000.

Yamamoto, Hachizou: *See*—
Nakatani, Hiroshi; and Yamamoto, Hachizou, 4,408,292., Cl. 364-405.000.

Yamamoto, Hiroshi: *See*—
Takatsuka, Keizo; Yamamoto, Hiroshi; and Baba, Toshihiro, 4,408,108., Cl. 200-148.00A.

Yamamoto, Kazuo: *See*—
Ina, Katutoshi; Yamamoto, Kazuo; Higashiyama, Hirokichi; Ishikawa, Norio; and Miyoshi, Hiroshi, 4,407,681., Cl. 148-12.00F.

Yamamoto, Keisuke: *See*—
Inohara, Shizuo; Masuda, Mitsuya; Iyehara, Sadahiro; Ueda, Minoru; and Yamamoto, Keisuke, 4,408,143., Cl. 315-366.000.

Yamamura, Takashi, to Victor Company of Japan, Ltd. Disc-shaped recording medium reproducing apparatus. 4,408,321., Cl. 369-77.200.

Yamanaka, Minoru; Suzuki, Mitsuyuki; Haneda, Hideo; Kato, Masatoshi; and Ohtsuki, Masataka, to Aisin Seiki Kabushiki Kaisha. Temperature sensing valve. 4,407,448., Cl. 236-88.000.

Yamashita, Masaaki: *See*—
Hara, Tomihiro; Ogawa, Masahiro; Yamashita, Masaaki; and Tajiri, Yasuhisa, 4,407,899., Cl. 428-626.000.

Yamasoba, Takahiko: *See*—
Ohtsuki, Akira; Ishino, Hirokichi; Sakai, Hiromu; Tsuchiko, Susumu; Tawara, Kazuo; and Yamasoba, Takahiko, 4,407,689., Cl. 156-243.000.

Yamaya, Hiroshi: *See*—
Watanabe, Masayuki; Yamaya, Hiroshi; and Kurohata, Hitoshi, 4,407,552., Cl. 339-143.00R.

Yamazaki, Nobuhiro: *See*—
Ichiyanagi, Toshikazu; Sudoh, Kanzaburo; Ogawa, Keisuke; and Yamazaki, Nobuhiro, 4,407,652., Cl. 432-58.000.

Yanaihara, Noboru, to Otsuka Pharmaceutical Co., Ltd. Process for preparing antibody. 4,407,965., Cl. 436-547.000.

Yankov, Viktor I.: *See*—
Chegolya, Alexandr S.; Malykh, Vladimir A.; Chizhov, Vladimir V.; Yankov, Viktor I.; and Pirog, Nikolai I., 4,407,450., Cl. 239-8.000.

Yashiro, Kenji; and Tabata, Toshio, to Pioneer Electronic Corporation. Remote line monitoring method and device for CATV system. 4,408,345., Cl. 455-3.000.

Yasui, Toshihiro; and Warnke, Wayne L., to Yamaha Hatsudoki Kabushiki Kaisha. Snowmobile suspension unit. 4,407,386., Cl. 180-193.000.

Yasukawa, Saburo: *See*—
Uozumi, Norihira; Yamagata, Takeo; Yasukawa, Saburo; Tsutsumi, Yasuyuki; and Ono, Seiichiro, 4,407,904., Cl. 429-26.000.

Yokoi, Nobufumi: *See*—
Kataishi, Takao; and Yokoi, Nobufumi, 4,407,225., Cl. 118-425.000.

Yokota, Hideo; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Large aperture objective with behind the lens diaphragm. 4,407,568., Cl. 350-467.000.

Yokota, Tsuneshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Record/playback track tracking servo. 4,408,314., Cl. 369-46.000.

Yonezawa, Seiji: *See*—
Terao, Motoyasu; Horigome, Shinkichi; Shigematsu, Kazuo; Miyamura, Yoshinori; and Yonezawa, Seiji, 4,407,880., Cl. 428-156.000.

Yoon, Heeyoung, to Conoco Inc. Methanol dissociation using a copper-chromium-manganese catalyst. 4,407,238., Cl. 123-3.000.

Yoshida, Hajime, to Hajime Industries Ltd. Surveillance method and apparatus. 4,408,224., Cl. 358-108.000.

Yoshida, Hiroshi: *See*—
Izumi, Masao; Maruyama, Hideki; and Yoshida, Hiroshi, 4,407,186., Cl. 98-2.000.

Yoshida, Kenichi: *See*—
Hagihara, Bunji; Fukai, Tamotsu; Nomura, Kikuo; Yoshida, Kenichi; and Isshiki, Isao, 4,407,291., Cl. 128-635.000.

Yoshida Kogyo, K.K.: *See*—
Kanzaka, Yoshihiro, 4,407,049., Cl. 24-230.0AS.

Yoshihara, Toshiaki: *See*—
Kamoshida, Yoichi; Yoshihara, Toshiaki; Harita, Yoshiyuki; and Harada, Kunihiro, 4,407,927., Cl. 430-197.000.

Yoshikawa, Yoshihiko, to Mitsubishi Denki Kabushiki Kaisha. Angular error detecting device. 4,408,207., Cl. 343-362.000.

Yoshimura, Masakatsu: *See*—
Fukasawa, Akira; Yoshimura, Masakatsu; Kaneoya, Tatsuo; and Takahashi, Kenji, 4,407,756., Cl. 260-378.000.

Yoshino, Hiroshi: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,407,745., Cl. 260-112.50R.

Yoshioka, Yoshio: *See*—
Hozumi, Motoo; Nomura, Hiroaki; and Yoshioka, Yoshio, 4,408,052., Cl. 546-22.000.

Youdin, Myron; Clagnaz, Mario W., Jr.; and Louie, Henry. Proportional brake for powered wheelchairs. 4,407,393., Cl. 188-2.00F.
Youhas, Robert F.: *See*—
Bulley, Raymond M.; MacPherson, William F.; and Youhas, Robert F., 4,408,248., Cl. 361-91.000.
Young, David M. Process for obtaining nerve growth factor. 4,407,744., Cl. 260-112.00R.
Young, Glen C., to Essex Group Inc. Automatic resetting of control system for loss of functionality. 4,408,299., Cl. 364-900.000.
Young, James E.: *See*—
Trammell, W. Edgar; Young, James E.; Chidester, James R.; and Walker, Ralph S., 4,407,280., Cl. 128-205.260.
Young, Rodney C.: *See*—
Roantree, Michael L.; and Young, Rodney C., 4,407,808., Cl. 424-263.000.
Young, William C., to Bell Telephone Laboratories, Incorporated. Optical fiber switch. 4,407,562., Cl. 350-96.200.
Yuasa Battery Co., Ltd.: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,407,846., Cl. 427-35.000.
Yugen Kaisha Shinjoseisakusho: *See*—
Shinjo, Katsumi, 4,407,620., Cl. 411-387.000.
Yui, Tohru; Hirai, Hachiro; and Takamaru, Ken, to Denki Kagaku Kogyo Kabushiki Kaisha; and Toshiba Pharmaceutical Co., Ltd. Process for producing granule coated with tannic acid metal chelate compound. 4,407,863., Cl. 427-213.000.
Yukawa, Tatsuo, to Nippon Electric Co., Ltd. Receiver provided with a frequency synthesizer capable of storing fine tuning information. 4,408,349., Cl. 455-182.000.
Yukio, Ito: *See*—
Takahashi, Yuji; Hayashi, Hideki; Takagi, Satoshi; and Yukio, Ito, 4,408,237., Cl. 360-96.300.
Yurkanin, Robert M. Impedance heating system with skin effect particularly for railroad tank cars. 4,408,117., Cl. 219-320.000.
Yuyama, Toshio; Shiraki, Ryuzo; and Watanabe, Seizi, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-level signal generating circuit. 4,408,135., Cl. 307-474.000.
Zahnradfabrik Friedrichshafen, Aktiengesellschaft: *See*—
Dziuba, Peter; and Goeft, Manfred, 4,407,382., Cl. 180-10.000.
Zambelli, Robert G.: *See*—
Shogren, David K.; and Zambelli, Robert G., 4,407,581., Cl. 355-8.000.
Zega, Bogdan, to Battelle Development Corporation. Cylindrical magnetron sputtering cathode and apparatus. 4,407,713., Cl. 204-298.000.
Zeiss-Stiftung, Carl: *See*—
Piller, Horst; and Weber, Klaus, 4,407,569., Cl. 350-509.000.
Zeitlin, Wolf. Foldable hand cart. 4,407,521., Cl. 280-655.000.
Zemtsov, Mikhail U.: *See*—
Tolstopyatov, Konstantin S.; Lukyanov, Anatoly A.; Pyatibrat, Alexandr L.; Pryanishnikov, Igor S.; Maslov, Gennady N.; Bobovnikov, Nikolai G.; Gubin, Petr V.; Burmakin, Viktor I.; Marchenkov, Nikolai B.; Chirkin, Alexandr F.; Zemtsov, Mikhail U.; and Tonaevsky, Ernst L., 4,407,095., Cl. 51-112.000.
Zenith Radio Corporation: *See*—
Ensinger, James W.; and Hendrickson, Melvin C., 4,408,225., Cl. 358-120.000.
Midland, Richard W., 4,408,223., Cl. 358-67.000.
Nowaczyk, Philip J., 4,408,269., Cl. 363-126.000.
Zielinski, Timothy T.: *See*—
Eu, Victor K.; Feng, Milton; Zielinski, Timothy T.; and Whelan, James M., 4,407,694., Cl. 156-606.000.
Ziemann, Heinz: *See*—
Salzburg, Herbert; Meyborg, Holger; and Ziemann, Heinz, 4,408,061., Cl. 549-464.000.
Zinge, Thomas P.: *See*—
Crossley, Thomas J.; and Zinge, Thomas P., 4,407,781., Cl. 423-15.000.
Zipfel, George G., Jr., to Bell Telephone Laboratories, Incorporated. Method of making electromechanical transducers using improved flexible composite piezoelectric material. 4,407,054., Cl. 29-25.350.
Ziyad Incorporated: *See*—
Kapp, Ludwig J., 4,407,597., Cl. 400-625.000.
Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,408,076., Cl. 568-325.000.
Zweegers, Petrus W. Agricultural implement. 4,407,114., Cl. 56-344.000.
Zwirek, Chester S.: *See*—
Hanssen, Tore B.; and Zwirek, Chester S., 4,408,178., Cl. 337-320.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF OCTOBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anger, Anton, to Osterreichische Schiffswerften Aktiengesellschaft Linz-Korneuburg. Method of producing undercut tubular plastic articles. Re. 31,404., Cl. 264-573.000.

Ashby, Richard D.: *See*—
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., Re. 31,407., Cl. 364-200.000.

Berliner, Steven D.: *See*—
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., Re. 31,407., Cl. 364-200.000.

Burrous, Allen J., to Schlegel Corporation. Weatherstrip and method for sealing a gap. Re. 31,403., Cl. 156-60.000.

Citizen Watch Co., Ltd.: *See*—
Hashimoto, Yukio; and Morokawa, Shigeru, Re. 31,402., Cl. 368-159.000.

Corning Glass Works: *See*—
Paisley, Robert J., Re. 31,405., Cl. 501-84.000.

Cullity, Richard E.: *See*—
Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., Re. 31,400., Cl. 182-2.000.

Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., to Tesdata Systems Corporation. Computer monitoring system. Re. 31,407., Cl. 364-200.000.

Gaylord, Norman G., to Syntex (U.S.A.) Inc. Oxygen permeable contact lens composition, methods and article of manufacture. Re. 31,406., Cl. 526-279.000.

Hashimoto, Yukio; and Morokawa, Shigeru, to Citizen Watch Co., Ltd. Electronic timepiece. Re. 31,402., Cl. 368-159.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kusumoto, Yasuo, Re. 31,401., Cl. 368-69.000.

Kusumoto, Yasuo, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. Re. 31,401., Cl. 368-69.000.

Mark Industries: *See*—
Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., Re. 31,400., Cl. 182-2.000.

Morokawa, Shigeru: *See*—
Hashimoto, Yukio; and Morokawa, Shigeru, Re. 31,402., Cl. 368-159.000.

Osterreichische Schiffswerften Aktiengesellschaft Linz-Korneuburg: *See*—
Anger, Anton, Re. 31,404., Cl. 264-573.000.

Paisley, Robert J., to Corning Glass Works. Ceramic foam cement. Re. 31,405., Cl. 501-84.000.

Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., to Mark Industries. Self propelled and extensible boom. Re. 31,400., Cl. 182-2.000.

Ross, Charles B.: *See*—
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., Re. 31,407., Cl. 364-200.000.

Schlegel Corporation: *See*—
Burrous, Allen J., Re. 31,403., Cl. 156-60.000.

Syntex (U.S.A.) Inc.: *See*—
Gaylord, Norman G., Re. 31,406., Cl. 526-279.000.

Tamplin, Lyle R.: *See*—
Rallis, Rallie P.; Cullity, Richard E.; and Tamplin, Lyle R., Re. 31,400., Cl. 182-2.000.

Tesdata Systems Corporation: *See*—
Furtman, Eugene L.; Ross, Charles B.; Ashby, Richard D.; and Berliner, Steven D., Re. 31,407., Cl. 364-200.000.

LIST OF REEXAM PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Battles, Donald D., to Cadre Corporation, The. Ladle heating system. B1 4,229,211., 10-4-83, Cl. 266-44.000.

Bio-Energy system, Inc.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., B1 4,270,596., Cl. 165-1.000.

Cadre Corporation, The: *See*—
Battles, Donald D., B1 4,229,211., Cl. 266-44.000.

Frigstad, Robert A., to Minnesota Mining and Manufacturing Company. Adhesive composition containing high molecular weight polyamides, epoxy resins and curing agents. B1 3,449,280., 10-4-83, Cl. 523-402.000.

Krulick, Steven E.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., B1 4,270,596., Cl. 165-1.000.

Leonard, Ronald W.: *See*—
Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., B1 4,270,596., Cl. 165-1.000.

Minnesota Mining and Manufacturing Company: *See*—
Frigstad, Robert A., B1 3,449,280., Cl. 523-402.000.

Zinn, Michael F.; Krulick, Steven E.; and Leonard, Ronald W., to Bio-Energy system, Inc. Tube mat heat exchanger. B1 4,270,596., 10-4-83, Cl. 165-1.000.

LIST OF DESIGN PATENTEES

Ahi Paka, Limited: *See*—
McDiarmid, Donald P., III, 270,798., Cl. D6-189.000.

Airwick Industries, Inc.: *See*—
Joyaux, Yves; and Mandon, Jean-Pierre, 270,861., Cl. D28-77.000.
Joyaux, Yves; and Mandon, Jean-Pierre, 270,862., Cl. D28-77.000.

Alden, Steven. Boat platform. 270,828., 10-4-83, Cl. D12-318.000.

American Stemware Corporation: *See*—
Gicking, William D.; and Frisch, Heinz, 270,803., Cl. D7-39.000.

Anchor Hocking Corporation: *See*—
Thrush, James L., 270,802., Cl. D7-17.000.

Balderston, Peter W. Combined toy sewing machine and case therefor. 270,849., 10-4-83, Cl. D21-122.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 270,825., Cl. D12-192.000.

Bell Telephone Laboratories, Incorporated: *See*—
Genaro, Donald M.; Sylvester, Gordon E.; and Varadarajan, G., 270,834., Cl. D14-57.000.

Bender, Allan W.: *See*—
Mahaffey, Steven J.; and Bender, Allan W., 270,852., Cl. D21-217.000.

Bennato, Andre, to Sanistyl Creations - S.A.R.L. Soap dish. 270,795., 10-4-83, Cl. D6-90.000.

Bernat Fontlladosa, Enrique. Combined display container and packaging insert. 270,812., 10-4-83, Cl. D9-318.000.

Bird, Larry C. Combined dispensing unit for squeezing toothpaste tubes and holder for toothbrushes. 270,794., 10-4-83, Cl. D6-87.000.

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CLASS 72

47 4,407,149
61 4,407,150
241 4,407,151

CLASS 73

1 G 4,407,152
23 4,407,153
46 4,407,171
66 4,407,154
116 4,407,155
118 4,407,156
151 4,407,157
196 4,407,158
290 R 4,407,159
296 4,407,160
505 4,407,161
527 4,407,162
607 4,407,163
831 4,407,164
862.54 4,407,165

CLASS 74

493 4,407,166
501 R 4,407,167
579 E 4,407,168
604 4,407,169
805 4,407,170

CLASS 75

10 R 4,407,672
128 A 4,407,673
251 4,407,674

CLASS 76

112 4,407,172

CLASS 81

9.5 A 4,407,174
9.5 R 4,407,173
57.39 4,407,175

CLASS 82

2.5 4,407,176
61 4,408,181

CLASS 83

300 4,407,177
835 4,407,178
865 4,407,179

CLASS 84

275 4,407,181
453 4,407,182

CLASS 89

1.5 B 4,407,180

CLASS 91

1 4,407,183
376 R 4,407,184

CLASS 98

1.5 4,407,185
2 4,407,186
41 SV 4,407,187
116 4,407,188

CLASS 99

421 HH 4,407,189

CLASS 100

88 4,407,190
99 4,407,191

CLASS 101

7 4,407,192
93.01 4,407,193
93.34 4,407,194
123 4,407,195
142 4,407,196
148 4,407,197
248 4,407,198
375 4,407,199

CLASS 102

202.5 4,407,200
248 4,407,201

CLASS 105

271 4,407,202
462 4,407,203

CLASS 106

35 4,407,675
88 4,407,676
97 4,407,677

CLASS 109

59 R 4,407,204

CLASS 110

264 4,407,205
347 4,407,206

CLASS 111

85 4,407,207

CLASS 112

121.12 4,407,208
147 4,407,209
167 4,407,210
260 4,407,211

CLASS 114

108 4,407,212
222 4,407,213
249 4,407,214
289 4,407,215
347 4,407,216

CLASS 118

24 4,407,217
59 4,407,218
60 4,407,219
64 4,407,220
109 4,407,221
110 4,407,222
212 4,407,223
405 4,407,224
425 4,407,225
623 4,407,226
642 4,407,227
651 4,407,228
702 4,407,229
716 4,407,230

CLASS 119

1 4,407,231
103 4,407,232
106 4,407,233
158 4,407,234

CLASS 122

161 4,407,235
390 4,407,236
4,407,237

CLASS 123

3 4,407,238
44 C 4,407,239
56 BC 4,407,240
90.16 4,407,241
179 G 4,407,243
188 S 4,407,242
339 4,407,244
359 4,407,245
415 4,407,246
438 4,407,247
439 4,407,248
449 4,407,249
450 4,407,250
472 4,407,251
504 4,407,252
506 4,407,253
549 4,407,254
595 4,407,255
599 4,407,256
612 4,407,257
617 4,407,258
620 4,407,259

CLASS 124

35 A 4,407,260
41 A 4,407,261

CLASS 125

13 R 4,407,262
15 4,407,263

CLASS 126

120 4,407,264
193 4,407,265
299 D 4,407,266
419 4,407,267
430 4,407,268
442 4,407,269
450 4,407,270

CLASS 128

1 D 4,407,271
6 4,407,272
4,407,273
69 4,407,274
79 4,407,275
4,407,278
80 C 4,407,276
82 4,407,277
200.11 4,407,279
205.26 4,407,280
207.15 4,407,281
207.21 4,407,282
218 F 4,407,283
325 4,407,285
334 R 4,407,286
419 PG 4,407,288
4,407,289
633 4,407,290
635 4,407,291
653 4,407,292
660 4,407,293
4,407,294
670 4,407,295
675 4,407,296
681 4,407,297
713 4,407,298
731 4,407,299
734 4,407,300
774 4,407,301
784 4,407,302
785 4,407,303
786 4,407,304

CLASS 130

31 R 4,407,305

CLASS 131

296 4,407,306
308 4,407,307
336 4,407,308

CLASS 132

45 R 4,407,309
73 4,407,310
88.5 4,407,311

CLASS 133

8 A 4,407,313
4,407,314
8 R 4,407,312

CLASS 134

58 R 4,407,315
104 4,407,316
167 R 4,407,678

CLASS 135

27 4,407,317
66 4,407,318
87 4,407,319

CLASS 136

226 4,408,088
250 4,407,320

CLASS 137

13 4,407,321
268 4,407,322
382 4,407,324
454.2 4,407,323
514 4,407,325
553 4,407,326
625.3 4,407,327
625.6 4,407,328
629 4,407,329

CLASS 138

30 4,407,330

CLASS 139

110 4,407,331
304 4,407,332
415 4,407,333
435 4,407,334
452 4,407,335
4,407,336

CLASS 140

124 4,407,337

CLASS 141

1 4,407,338
10 4,407,339
67 4,407,340
97 4,407,341

CLASS 144

2 R 4,407,342
34 E 4,407,343
87 4,407,344
211 4,407,345

CLASS 148

2 4,407,679
12 F 4,407,680
4,407,681
128 4,407,682
144 4,407,683

CLASS 152

209 R 4,407,346
361 FP 4,407,347
410 4,407,348

CLASS 156

60 Re.31,403
133 4,407,684
212 4,407,685
215 4,407,686
227 4,407,687
242 4,407,688
243 4,407,689
244.27 4,407,690
304.2 4,407,691
350 4,407,692
436 4,407,693
606 4,407,694
643 4,407,695
653 4,407,696

CLASS 160

98 4,407,349
178 R 4,407,350

CLASS 162

137 4,407,697
258 4,407,698

CLASS 165

1 4,407,351
1 B1 14,270,596
9.1 4,407,352
39 4,407,353
42 4,407,354
104.16 4,407,355
132 4,407,356
165 4,407,357
166 4,407,358
167 4,407,359

CLASS 166

68 4,407,360
85 4,407,361
117.5 4,407,362
183 4,407,363
217 4,407,364
249 4,407,365
250 4,407,366
267 4,407,367
284 4,407,368

291 4,407,369

CLASS 171

124 4,407,370

CLASS 172

253 4,407,371
572 4,407,372

CLASS 173

141 4,407,373

CLASS 174

34 4,408,089
48 4,408,090
74 R 4,408,091
88 R 4,408,092

CLASS 175

24 4,407,374
228 4,407,375
267 4,407,376
325 4,407,377
340 4,407,378

CLASS 177

52 4,407,379
145 4,407,380

CLASS 178

22.19 4,408,093

CLASS 179

2 EC 4,408,099
27 D 4,408,100
90 BD 4,408,101
99 H 4,408,102

CLASS 180

6.48 4,407,381
10 4,407,382
54 E 4,407,383
146 4,407,384
175 4,407,385
193 4,407,386
247 4,407,387
271 4,407,388

CLASS 181

135 4,407,389
230 4,407,390

CLASS 182

2 Re.31,400
9 4,407,391
128 4,407,392

CLASS 188

2 F 4,407,393
71.4 4,407,394
134 4,407,395
282 4,407,396
4,407,397

CLASS 192

0.055 4,407,398
4 A 4,407,399
12 C 4,407,400
61 4,407,401

CLASS 198

389 4,407,402
494 4,407,403
621 4,407,408
774 4,407,404
4,407,405
4,407,406
777 4,407,407

CLASS 200

6 A 4,408,103
61.54 4,408,104
68 4,408,105
4,408,106
144 B 4,408,107
148 A 4,408,108
153 J 4,408,109
263 4,408,110
318 4,408,111

CLASS 201

39 4,407,699

CLASS 202

85 4,407,700
99 4,407,701
263 4,407,702

CLASS 203

43 4,407,703

CLASS 204

1 T 4,407,704
157.1 H 4,407,705
190 4,407,706
4,407,707
192 R 4,407,708
192 S 4,407,710
192 SP 4,407,709
196 4,407,711
298 4,407,712
4,407,713

CLASS 206

45.31 4,407,409
387 4,407,410
4,407,411
404 4,407,412
493 4,407,413
553 4,407,414

CLASS 208

120 4,407,714

CLASS 209

164 4,407,715
556 4,407,415

CLASS 210

155 4,407,716
616 4,407,717
626 4,407,718
695 4,407,719
777 4,407,720

CLASS 211

41 4,407,416
69.1 4,407,417
87 4,407,418

CLASS 212

189 4,407,419
199 4,407,420

CLASS 215

12 R 4,407,421
246 4,407,422

CLASS 219

61 4,408,112
69 M 4,408,113
110 4,408,114
119 4,408,115
273 4,408,116
320 4,408,117

CLASS 220

260 4,407,423
269 4,407,424
4,407,425
306 4,407,426
339 4,407,427
356 4,407,428
359 4,407,429

CLASS 221

122 4,407,430

CLASS 222

1 4,407,431
54 4,407,432
63 4,407,433
214 4,407,434
481 4,407,435
636 4,407,436

CLASS 224

270 4,407,437

CLASS 226

15 4,407,438
20 4,407,439

CLASS 228

6 A 4,407,440
176 4,407,441

CLASS 229

28 R 4,407,442

CLASS 235

382 4,408,119
449 4,408,122
462 4,408,120
494 4,408,121

CLASS 236

12.1 4,407,444
49 4,407,445
4,407,446
4,407,447
88 4,407,448

CLASS 237

12.3 R 4,407,449

CLASS 239

8 4,407,450
66 4,407,451
132.5 4,407,452
145 4,407,453
154 4,407,454
222.17 4,407,455
423 4,407,456
533.12 4,407,457

CLASS 241

282.1 4,407,458

CLASS 242

55.53 4,407,459
86.5 A 4,407,460
134 4,407,461
184 4,407,462
201 4,407,463

CLASS 244

3.13 4,407,464
3.16 4,407,465
17.11 4,407,466
4,407,467
137 P 4,407,468
169 4,407,469

CLASS 246

34 R 4,407,470

CLASS 248

59 4,407,479
63 4,407,471
89 4,407,472
95 4,407,473
97 4,407,474
156 4,407,475
235 4,407,476
499 4,407,477
542 4,407,478

CLASS 249

189 4,407,480

CLASS 250

226 4,408,123
252.1 4,408,124
288 4,408,125
442.1 4,408,126

CLASS 251

148 4,407,482
287 4,407,483
353 4,407,481

CLASS 252

62.59 4,407,721
91 4,407,722
192 4,407,723
312 4,407,724
512 4,407,739
522 R 4,407,740
542 4,407,741
628 4,407,742
700 4,407,743

CLASS 256

10 4,407,485
13.1 4,407,484

CLASS 260

112 R 4,407,744
112.5 E 4,407,746
112.5 R 4,407,745
120 4,407,747
153 4,407,748
155 4,407,749
239 A 4,407,750
239.1 4,407,751
239.3 P 4,407,752
239.55 D 4,407,754
239.55 R 4,407,753
245.2 R 4,407,755
378 4,407,756
413 4,407,757
429.9 4,407,758
440 4,407,759
465 F 4,407,760
502.5 C 4,407,761
508 4,407,762
940 4,407,763
4,407,764
970 4,407,765

CLASS 264

2.2 4,407,766
40.1 4,407,767
54 4,407,768
60 4,407,769
69 4,407,770
115 4,407,771
294 4,407,772
573 Re.31,404

CLASS 266

44 B1 4,229,211
87 4,407,486
114 4,407,487
148 4,407,488
191 4,407,489
266 4,407,490

CLASS 267

103 4,407,492
140.1 4,407,491

CLASS 269

93 4,407,493

CLASS 272

1 D 4,407,494
117 4,407,495
119 4,407,496
4,407,497

CLASS 273

1.5 R 4,407,498
54 B 4,407,499
75 4,407,500
118 R 4,407,501
153 R 4,407,504
153 S 4,407,502
177 R 4,407,505
187 B 4,407,506
197 R 4,407,503
400 4,407,507

CLASS 277

1 4,407,508
4,407,518
3 4,407,509
12 4,407,510
24 4,407,511
96.1 4,407,512
4,407,513
117 4,407,514
139 4,407,515
206 R 4,407,516
212 FB 4,407,517

CLASS 280

482 4,407,519
624 4,407,520
655 4,407,521
809 4,407,522

CLASS 281

46 4,407,523

CLASS 282

9 R 4,407,524

CLASS 283

110 4,407,525

CLASS 285

27 4,407,526
4,407,527
50 4,407,528
82 4,407,529
140 4,407,530
158 4,407,531
256 4,407,532
281 4,407,533
305 4,407,534

CLASS 290

54 4,408,127

CLASS 292

27 4,407,535
29 4,407,536
87 4,407,538
337 4,407,537
338 4,407,539

CLASS 296

146 4,407,540
216 4,407,541

CLASS 297

103 4,407,542
330 4,407,543
362 4,407,544

CLASS 299

30 4,407,545
34 4,407,546

CLASS 303

6 A 4,407,547
6 C 4,407,549
6 M 4,407,548

CLASS 305

35 EB 4,407,550
57 4,407,551

CLASS 307

270 4,408,129
296 R 4,408,130
311 4,408,131
359 4,408,132
362 4,408,133
471 4,408,134
474 4,408,135
475 4,408,136
598 4,408,137

CLASS 310

12 4,408,138
13 4,408,139
234 4,408,140

CLASS 315

56 4,408,141
82 4,408,142
366 4,408,143

CLASS 318

7 4,408,144
135 4,408,145
264 4,408,146
493 4,408,147
610 4,408,148
729 4,408,149
779 4,408,150

CLASS 320

2 4,408,151

CLASS 322

29 4,408,152

CLASS 323

224 4,408,153
340 4,408,154

CLASS 324

51 4,408,155
58.5 R 4,408,156
62 4,408,157
65 R 4,408,128
78 R 4,408,158
207 4,408,159
209 4,408,160
303 4,408,161
318 4,408,162
404 4,408,163

CLASS 328

117 4,408,164
134 4,408,165

CLASS 329

106 4,408,166

CLASS 330

261 4,408,167

CLASS 331

57 4,408,168
65 4,408,169

CLASS 333

172 4,408,170
177 4,408,171

CLASS 334

11 4,408,172

CLASS 335

16 4,408,173
20 4,408,174

CLASS 336

92 4,408,175
107 4,408,176
139 4,408,177

CLASS 337

320 4,408,178

CLASS 339

14 P 4,407,553
37 4,407,554
75 M 4,407,555
91 R 4,407,556
97 R 4,407,557
121 4,407,558
126 R 4,407,559
143 R 4,407,552
154 L 4,407,560

CLASS 340

32 4,408,179
40 4,408,180
310 A 4,408,185
4,408,186
321 4,408,182
323 R 4,408,183
332 4,408,187
345 4,408,188
347 DA 4,408,190
347 DD 4,408,189
365 R 4,408,191
365 S 4,408,184
407 4,408,192
566 4,408,193
626 4,408,194
685 4,408,195
690 4,408,196
720 4,408,197
729 4,408,198
731 4,408,199
747 4,408,200
784 4,408,201
785 4,408,202
825.34 4,408,203
870.24 4,408,204

CLASS 343

16 R 4,408,205
352 4,408,206
362 4,408,207
786 4,408,208
861 4,408,209

CLASS 346

74.2 4,408,210
75 4,408,211
76 PH 4,408,212
135.1 4,408,213
159 4,408,214
165 4,408,215

CLASS 350

96.20 4,407,562
96.3 4,407,561
173 4,407,563
174 4,407,564
374 4,407,565
404 4,407,566
423 4,407,567
467 4,407,568
509 4,407,569
529 4,407,570

CLASS 351

13 4,407,571
212 4,407,572

CLASS 354

33 4,407,573
50 4,407,574
115 4,407,575
135 4,407,576
173 4,407,577
235 4,407,578
275 4,407,579

CLASS 355

3 TR 4,407,580
8 4,407,581

CLASS 356

312 4,407,582
350 4,407,583

CLASS 357

15 4,408,216
17 4,408,217
70 4,408,218
80 4,408,219
81 4,408,220

CLASS 358

22 4,408,221
24 4,408,222
67 4,408,223
108 4,408,224
120 4,408,225
139 4,408,226
4,408,227
167 4,408,228
177 4,408,229
213 4,408,230
280 4,408,231
4,408,232
284 4,408,233

CLASS 360

69 4,408,234
71 4,408,235
74.3 4,408,317
85 4,408,236
96.3 4,408,237
104 4,408,238
107 4,408,239
121 4,408,240
128 4,408,241
131 4,408,242
137 4,408,243

CLASS 361

24 4,408,244
36 4,408,245
64 4,408,246
79 4,408,247
91 4,408,248
127 4,408,249
160 4,408,250
172 4,408,251
288 4,408,252
293 4,408,253
321 4,408,254
382 4,408,255
403 4,408,256
433 4,408,257
4,408,258
434 4,408,259

CLASS 362

32 4,408,260
104 4,408,261
147 4,408,262
189 4,408,263
200 4,408,264
238 4,408,265
297 4,408,266

CLASS 363

17 4,408,267
62 4,408,268
126 4,408,269
132 4,408,270

CLASS 364

200 Re.31,407
4,408,271
4,408,272
4,408,273
4,408,274
4,408,275
4,408,276
300 4,408,277
405 4,408,292
424 4,408,278
426 4,408,293
431.05 4,408,279
474 4,408,280
476 4,408,281
482 4,408,282
483 4,408,283
485 4,408,284
508 4,408,285
4,408,294
513 4,408,286
518 4,408,287
525 4,408,288
551 4,408,289
552 4,408,295
566 4,408,290
569 4,408,296
4,408,297
717 4,408,298
900 4,408,291
4,408,299
4,408,300
4,408,301
4,408,302

CLASS 365

174 4,408,304
189 4,408,305
205 4,408,303
218 4,408,306

CLASS 366

279 4,407,584

CLASS 367

79 4,408,307
197 4,408,308

CLASS 368

12 4,407,585
69 Re.31,401
77 4,407,586
108 4,407,587
118 4,407,588
159 Re.31,402
201 4,407,589
204 4,407,590

CLASS 369

7 4,408,309
41 4,408,310
43 4,408,311
4,408,312
45 4,408,313
46 4,408,314
71 4,408,315
77.2 4,408,316
4,408,321
261 4,408,318
275 4,408,319
290 4,408,320

CLASS 370

17 4,408,322
60 4,408,323
81 4,408,324
119 4,408,325

CLASS 371

38 4,408,326
47 4,408,327
62 4,408,328

CLASS 372

21 4,408,329
45 4,408,330
46 4,408,331
98 4,408,334

CLASS 375

14 4,408,332
95 4,408,333

CLASS 376

299 4,407,773
300 4,407,774

CLASS 377

2 4,408,118
18 4,408,335
34 4,408,336
44 4,408,337

CLASS 378

034 4,408,338
173 4,408,339
187 4,408,340
196 4,408,341

CLASS 381

11 4,408,098
15 4,408,097
24 4,408,095
107 4,408,096
120 4,408,094

CLASS 382

9 4,408,342
52 4,408,343
62 4,408,344

CLASS 383

5 4,407,443

CLASS 400

54 4,407,592
124 4,407,591
208 4,407,593
212 4,407,594
4,407,595
253 4,407,596
625 4,407,597

CLASS 403

4 4,407,598
11 4,407,599
23 4,407,600
25 4,407,601
336 4,407,602
370 4,407,603

CLASS 404

75 4,407,604
77 4,407,605

CLASS 405

17 4,407,606
26 4,407,607
31 4,407,608
146 4,407,609
259 4,407,610
284 4,407,611
285 4,407,612

CLASS 406

84 4,407,613

CLASS 408

13 4,407,614
239 A 4,407,615

CLASS 410

3 4,407,616
59 4,407,617

CLASS 411

40 4,407,618
43 4,407,619
387 4,407,620

CLASS 414

35 4,407,628
433 4,407,621
468 4,407,622
540 4,407,623
546 4,407,624
728 4,407,625
740 4,407,626
745 4,407,629
757 4,407,627
786 4,407,630

CLASS 415

122 R 4,407,631

CLASS 416

97 R 4,407,632
140 4,407,633
196 R 4,407,634
230 4,407,635

CLASS 417

118 4,407,636
138 4,407,637
269 4,407,638
292 4,407,639
296 4,407,640
356 4,407,641
366 4,407,642
401 4,407,643
462 4,407,644

CLASS 418

131 4,407,645

CLASS 419

36 4,407,775

CLASS 420

477 4,407,776

CLASS 422

46 4,407,777
90 4,407,778
266 4,407,779

CLASS 423

10 4,407,780
15 4,407,781
228 4,407,784
328 4,407,782
347 4,407,783
659 4,407,785

CLASS 424

14 4,407,786
28 4,407,787
49 4,407,788
69 4,407,789
78 4,407,790
80 4,407,791
81 4,407,792
4,407,793
177 4,407,794
180 4,407,795
4,407,796
246 4,407,797
4,407,798
4,407,799
247 4,407,800
250 4,407,801
253 4,407,802
258 4,407,803
260 4,407,804
4,407,805
263 4,407,806
4,407,807
4,407,808
267 4,407,809
270 4,407,810
272 4,407,811
273 P 4,407,813
273 R 4,407,812
4,407,814
274 4,407,815
275 4,407,816
4,407,817
289 4,407,818
304 4,407,819
4,407,820
312 4,407,821
315 4,407,822
317 4,407,823
329 4,407,824
336 4,407,825

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174.4 4,407,646
208 4,407,647
457 4,407,648

CLASS 426

7 4,407,826
19 4,407,827
56 4,407,828
59 4,407,829
272 4,407,830
281 4,407,831
4,407,832
4,407,833
422 4,407,834
552 4,407,835
576 4,407,836
578 4,407,837
602 4,407,838
622 4,407,839
629 4,407,840
656 4,407,841

CLASS 427

1 4,407,842
2 4,407,843
3 4,407,844
13 4,407,845
35 4,407,846
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36 4,407,848
37 4,407,849
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130 4,407,861
144 4,407,862
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216 4,407,864
217 4,407,865
221 4,407,866
365 4,407,867
376.2 4,407,868
443.1 4,407,869

CLASS 428

1 4,407,870
31 4,407,871
35 4,407,872
4,407,873
4,407,874
43 4,407,875
102 4,407,876
105 4,407,877
119 4,407,878
141 4,407,879
156 4,407,880
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159 4,407,882
215 4,407,883
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246 4,407,885
320.8 4,407,886
332 4,407,887
355 4,407,888
398 4,407,889
408 4,407,890
410 4,407,891
411 4,407,892
454 4,407,893
457 4,407,894
463 4,407,895
513 4,407,896
516 4,407,897
542.8 4,407,898
626 4,407,899
659 4,407,900
694 4,407,901

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23 4,407,903
26 4,407,904
42 4,407,905
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4,407,907
45 4,407,908
50 4,407,909
57 4,407,910
94 4,407,911
104 4,407,912
137 4,407,913
174 4,407,914
217 4,407,915

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23 4,407,916
42 4,407,917
54 4,407,918
58 4,407,919
59 4,407,920
96 4,407,921
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147 4,407,963
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3 4,408,345
175 4,408,346
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295 4,408,352
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610 4,408,354

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95 4,407,969
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9 4,407,734
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25 4,407,725
60 4,407,728
115 4,407,727
161 4,407,726
174 4,407,733
200 4,407,729
203 4,407,731
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243 4,407,737
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711 4,407,974

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99 4,407,980
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122 4,407,982
128 4,407,983

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115 4,407,984
161 4,407,985
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340 4,407,989
402 B1 3,449,280

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38 4,407,990
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182 4,408,044
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360 4,408,049

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17 4,408,050
19 4,408,051
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226 4,408,053
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562 4,408,057

CLASS 549

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517 4,408,062
518 4,408,063

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427 4,408,064

CLASS 560

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226 4,408,068
232 4,408,069

CLASS 562

470 4,408,070
536 4,408,071

CLASS 564

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204 4,408,073
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474 4,408,075

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441 4,408,077
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484 4,408,080
571 4,408,081
4,408,082
576 4,408,083
601 4,408,084
697 4,408,085
719 4,408,086
724 4,408,087

CLASS 604

6 4,407,660
155 4,407,659
385 4,407,284

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D2—	24	270,774		37	270,790	D8—	18	270,807		114	270,823		144	270,838	D22—	27	270,854
		270,775		56	270,791		60	270,808		180	270,824	D16—	1	270,839		31	270,855
	27	270,776		69	270,792		68	270,809		192	270,825		6	270,840	D23—	2	270,856
	270	270,777		87	270,794		317	270,810		211	270,826	D17—	20	270,841		4	270,857
	310	270,778		90	270,795	D9—	305	270,811		302	270,827			270,842		94	270,858
	314	270,779		113	270,796		318	270,812		318	270,828	D19—	51	270,843	D24—	31	270,859
	319	270,780		125	270,797		388	270,813		323	270,829		64	270,844	D25—	16	270,860
	353	270,781		189	270,798			270,814	D13—	32	270,830		85	270,845	D28—	77	270,861
	431	270,782		192	270,799	D10—	50	270,815		40	270,831	D21—	34	270,846			270,862
D3—	28	270,783		201	270,800		70	270,816	D14—	1	270,832		71	270,847		91.1	270,863
	37	270,784		209	270,801		78	270,817		11	270,833		74	270,848			270,864
	40	270,785	D7—	17	270,802		84	270,818		53	270,836		122	270,849	D32—	21	270,865
	75	270,786		39	270,803			270,819		57	270,834		165	270,850	D34—	22	270,866
D6—	23	270,787		77	270,804		109	270,820		64	270,835		204	270,851		44	270,867
		270,788		363	270,805	D11—	87	270,821	D15—	70	270,793		217	270,852	D99—	35	270,868
	28	270,789		406	270,806	D12—	102	270,822		139	270,837		218	270,853			

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DESIGN PATENTS

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270,866
49 : 270,855
55 : 270,799

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5,115

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